SCIENCE & TECHNOLOGY INFORMATION TRANSFER NETWORK RESEARCH PROJECT

FINAL REPORT

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GOVERNMENT OF NEW BRUNSWICK

GOUVERNEMENT DU NOUVEAU-BRUNSWICK

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EXECUTIVE SUMMARY

As a result of a study of the Science and Technology Information Transfer Network completed by Baseline Market Research, the following observations can be made:

The functioning of the Science and Technology Transfer Network would improve if there was a clarification of policies and directives related to the Network and a clarification of the roles of each of the participants in the network.

The reach of the network is fairly small. According to the survey of 300 of the more innovative businesses in the province, the highest contact point was the Department of Commerce and Technology: 40% of these firms indicated that they had made contact with this department. The next most commonly contacted node in the Network was R.P.C. where 33% of the firms claimed to have made contact. Some of the newer services offered through this network have made contact with less than 10% of the more innovative firms.

As is often the case in analyzing the flow of information, this research identified a gap in the information available and the ability of business firms to access that information. A variety of factors appear to contribute to this gap. For example, business owners, managers and entrepreneurs may be too busy to come into contact with those who have the needed information in an environment which is conducive to absorption of information. It should also be noted that the businessperson's primary source of information is other businesspeople - not the university or the governmental or quasi-governmental arena.

> There appears to be a need for a system of information access and delivery which better accommodates the needs of the receiver rather than the sender in a two-way communications network.

The research has produced an implementation plan which acts on these observations and suggests the ways in which information related to science and technology can be more easily transferred to the private sector. This plan is summarized in the following material.

IMPLEMENTATION PLAN
ACTIVITIES WITHIN STAGES

STAGE 1	REQUIRED ACTIONS	TIME	COST
Policy formulation, adoption and coordination	1) Governmental adoption of the strategic plan by cabinet	November-December, 1988	0*
Objective: to provide the overall direction and decisions needed to develop a more effective network	2) Establishment of inter-governmental liaison committee	December, 1988	0
Description: this process will not only provide direction, but will also coordinate the use of resources. If the funding agencies cannot agree to a plan, there is little hope that those competing for funds will be able to agree to a division of resources	3) Designation of the sponsoring agency for the implementation of the strategic plan	December-January, 1988	0
	4) Development of long term funding plan for resources by various funding agencies	Completed by April 30, 1989	0
	5) A process has to be established for input from suppliers which will be given the opportunity to define their relationships within this network - this is similar to the public hearing process. (Determined by Little study)	Completed by April 30, 1989	0

*If a '0' cost is assigned, it assumes that existing staff and resources will be used.

IMPLEMENTATION PLAN
ACTIVITIES WITHIN STAGES

STAGE 2	REQUIRED ACTIONS	TIME	COST
Coordination of support services and resource facilities Objective: to improve the coordination between the public and private sector and increase the overall level of R&D and innovation Description: it is recommended that the coordinating group make specific recommendations concerning the services to be provided by the agencies being funded	1) The committee of funding sources should clearly define the services allocated to each organization being funded - and the funding sources should assume responsibility for avoiding conflict and eliminating duplication	Roles defined 6/30/89 Funding plan effective 9/1/88	-0-
	2) Special conditions should be attached to each grant to insure compliance with establishment of regional offices	Clearly defined by 6/30/89	-0-
	3) Work between university administrators and funding sources to develop coordinated approaches to resource development and management - especially coorination of library resources (basic sciences)	Completed 8/30/89	-0-

TABLE 2 (Continued)

4) There is a need to have an internal coordinating committee which will attempt to convey the basic and applied research activities to the appropriate industry and government sectors. This committee would become actively involved in the information transfer activities outlined in Stage 4	Designated 6/30/89	-0-

IMPLEMENTATION PLAN

ACTIVITIES WITHIN STAGES

STAGE 3	REQUIRED ACTIONS	TIME	COST
Development of regional business centres	1) Obtain endorsement of cabinet and coordinating committee for this approach	The BIC's should be established over a three year period, indicated below	
Objective: to improve business access, especially for small and medium size businesses, to information and resources related to science and technology	2) Designate service sites (research suggests Saint John, Moncton and Bathurst-Fredericton is served by central offices)	Year 1	237,300 (Moncton) (1 site)
		Year 2	711,900 (Saint John, Bathurst) (3 sites)
Description: throughout the research, there was evidence of an uncoordinated approach to business contacts. This approach attempts to establish a one-stop front-line information service. This does not purport to offer on-site scientific research	3) Assign or recruit office management staff and make funding decisions	Year 3	949,200 (Fredericton) (4 sites)
	4) Request staff assignments and schedules from each participating agency		
	5) Locate space - in conjunction with industrial development commissions if possible		
	6) Plan coordinating meetings for participating agencies		
	7) Develop marketing/business contact approach (responsibility for coordination should be assigned to site manager)		
	8) Monitor on-going progress	See attached discussion	

IMPLEMENTATION PLAN
ACTIVITIES WITHIN STAGES

STAGE 4	REQUIRED ACTIONS	TIME	COST
Development of information seminars for sectors. Objective: to provide an annual opportunity for large and small businesses from a particular sector to come together to share information and gain knowledge from contact with key leaders, academics and government ressources/services Description: these annual seminars for key sectors of the economy will be well organized, high powered and informative opportunities to learn what others are doing and to be informed about key trends in the field	1) Designate key industries at least fishing, manufacturing and forestry would be appropriate initially 2) Designate funding levels and staff coordinators for each area. The coordinators should come from the Department of Commerce and Technology. These should be paired with a private sector resource person 3) Staff should solicit input during planning stages from additional government and private sector resource people to locate most appropriate speakers 4) Each seminar should be held in conjunction with a trade show of private sector suppliers and government agencies supplying services to a particular sector 5) During the first year, no more than 3 seminars should be held - and they should last no longer than 1 - 1.5 days. They should also be held during non-peak seasons for the industry	Year 1 (2) Year 2 (4) Year 3 (4)	$40,000 $80,000 $80-90,000

IMPLEMENTATION PLAN
ACTIVITIES WITHIN STAGES

STAGE 5	REQUIRED ACTIONS	TIME	COST
Development of an evaluation system Objective: to quantify and measure the progress made in the implementation of services through the network Description: it is apparent that there is a need to better define and evaluate the services put in place. This could not only identify any underutilization, but could also identify duplications and propose more appropriate alternatives	1) It is recommended that the coordinating committee retain the services of an independent, out of province consulting firm to evaluate the progress achieved under this plan. The evaluation model should also include an evaluation of the overall network. Criteria should be developed by the committee and the consultant 2) It is recommended that this plan be evaluated two years after acceptance with a mid-term evaluation to test appropriateness of measures at the end of the first year		$75-100,000

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1.0 BACKGROUND

1.1 INTRODUCTION

The following material provides a detailed report on the research project completed by Baseline Market Research Ltd. (Baseline) for the New Brunswick Department of Commerce and Technology. This project was specifically concerned with the development of an implementation plan for the Science and Technology Information Transfer Network (STITN) in New Brunswick.

The first section of this report contains the background material on this project: the research purpose, objectives and approaches. The second section contains a summary of information collected from those who are involved in the delivery of information and services as participants in the STITN. The third section provides a detailed summary of the information collected from the business community in this province: the beneficiaries of the transfer of scientific and technological information. The last section of this report contains Baseline's recommendations concerning the implementation plan for the STITN in this province. All data

collection instruments and supplemental information are presented in appendices to this report.

1.2 RESEARCH PURPOSE - OBJECTIVES

In October, 1984 a steering committee composed of representatives of the federal and provincial governments commissioned the first study on which to base the development of a science and technology strategy for New Brunswick.

According to this study, conducted by Arthur D. Little of Canada Limited, New Brunswick's Science and Technology Strategy, many businesses in this province had technology-related needs which could not be met at the local level. Consequently, there was a level of frustration in the business community as a result of the limited informational resources available. This study also suggested that there was a need to strengthen links between the business community and the services or suppliers which serve as sources of information. The Little study suggested that there is a need for significantly improved coordination and networking .

At the time of this study, some components of such a network were already in place and some linkages had been established. Additional network components have since been put in place. When the Little study was conducted, the overall network was not complete and no specific plan had been established to direct its completion.

Since the Little study, some of the recommendations have been accepted and implemented and some additional services have been put in place. However, a need exists to develop a plan to more fully implement the concept of a science and technology information network.

Given this situation, the primary purpose of this study, as stated in the Terms of Reference, was to document the existing Technology Information Transfer Network in this province, to identify the user needs that were not being met, and to recommend an action plan which will assist private sector firms in accessing scientific and technological information.

This study purpose was translated into the

following primary objective for this research:

> This project was designed to develop an Implementation Plan for the Government of Canada/Province of New Brunswick which will provide for the necessary access by provincial users (private sector firms) to scientific and technological information.

In order to accomplish this objective, it was necessary to update some of the information in the Little study and expand the information available. Basically, this study collected the following information:

1) An update and confirmation of existing policies and relationships or non-relationships on the supply side (service provider side) of the science and technology information system in New Brunswick.

2) A compilation of policies from the political and governmental perspective which serve as guides for the economic development of the province.

3) An assessment of the match between the

existing services offered and the demands found in the business community - in terms of information related to science, technology and innovation - a process of needs identification.

4) A delineation of the ways in which businesses gain access to updated information to enhance the level of innovation in their businesses or to make them more aware of opportunities or changes which could have an impact on their research activities.

Once these different types of information were accumulated, Baseline was able to develop a coherent plan which would ensure the transfer of available scientific and technological information from those who have the information to those who need the information. This entire process was designed to ensure New Brunswick businesses the opportunity to be as innovative as possible.

The following section describes the research approach used to accomplish the primary research objective.

1.3 RESEARCH APPROACH

In order to collect the type of information needed, Baseline implemented several research approaches.

As a first step, staff conducted a review of existing governmental documents concerning policies related to the STITN in place in New Brunswick. The information for this was primarily provided by the contract officer for the Department of Commerce and Technology, although additional material was collected from federal departments. A summary of the information collected is presented in another section of this report.

Once staff had a grounding in the current literature and had developed a basic awareness of the key participants in the STITN, a series of personal interviews were conducted with representatives of key sources of information identified in the Terms of Reference (other than FBDB which did not have a direct role in the service delivery system). In some instances more than one person was interviewed in order to

develop the needed information, or interviews with more than one person were necessary to solicit the input of those who may have been more actively involved in the development of a technology transfer system for New Brunswick. This second interview might have asked for an assessment of the practical implications of possible recommendations, for confirmation of other information collected elsewhere, or sought additional information for clarification purposes. The interview guide for the supplier interviews is included in Appendix B.

Personal interviews were also conducted with approximately twenty large and/or innovative firms. These contacts were either recommended in the discussions with the Steering Committee or were identified during the course of interviews with the suppliers (each supplier was asked to identify firms which they considered to be the most innovative). While not every firm on the list was contacted, the firms which were identified by suppliers as the most innovative are included in Appendix C.

Along with the personal interviews, Baseline conducted a telephone survey of businesses throughout the province. The actual selection of businesses contacted was the result of a random selection procedure; however, several steps had to be accomplished in order to develop an appropriate sampling or selection list. The final list included 610 businesses.

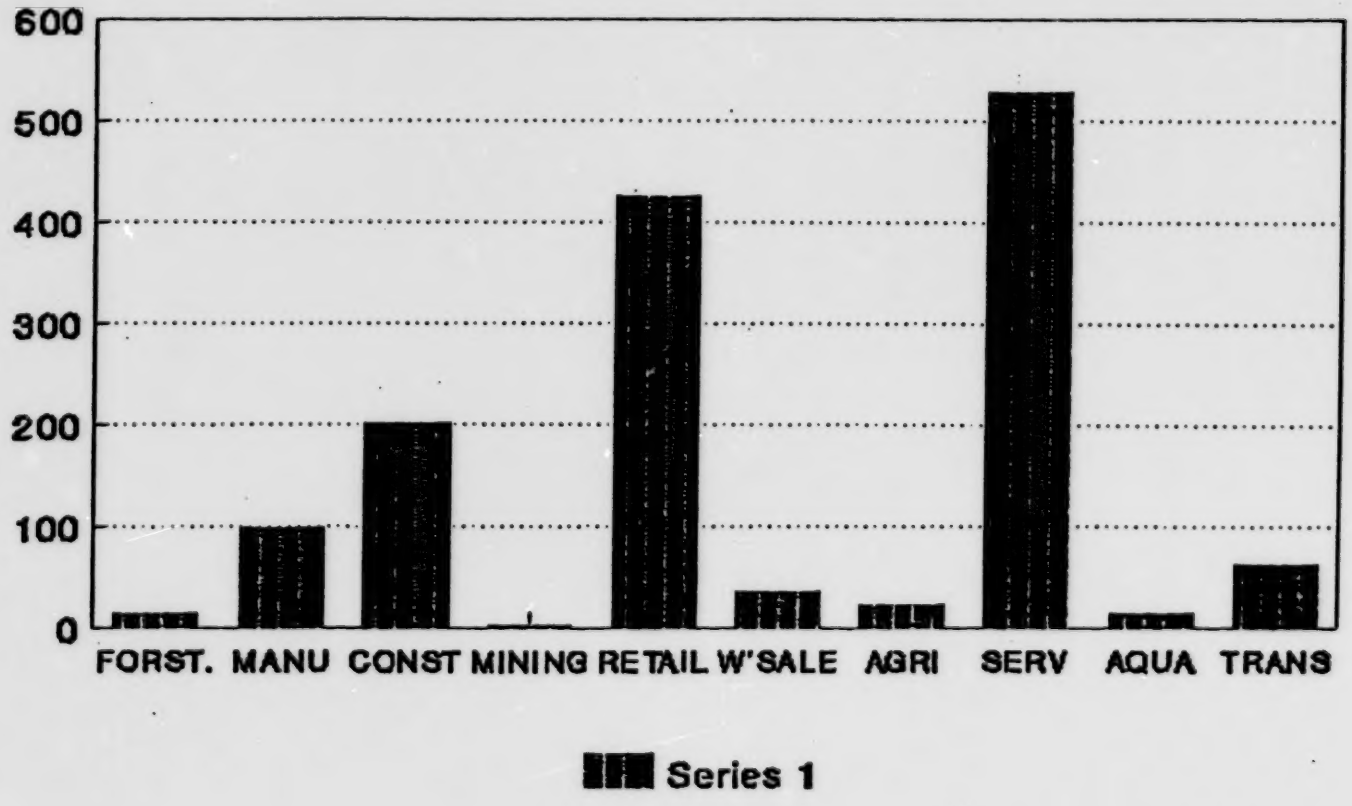
The first step in this process involved a count and classification of all businesses formed in New Brunswick between January 1 and June 30, 1988. This produced a listing and classification of 1,472 businesses. Table 1 and Chart 1 summarize the business profile developed.

TABLE 1
NEW BUSINESSES IN NEW BRUNSWICK

BUSINESS TYPE/ACTIVITY	NO.		% OF TOTAL	
FORESTRY	14		1%	
MINING	3		1%	
MANUFACTURING	98		7%	
OTHER		6		1%
FOOD		32		2%
BEVERAGES		4		1%
TEXTILE		2		1%
CLOTHING		-		
WOOD		17		1%
FURNITURE		6		1%
PRINTING		16		1%
FABRICATED METALS		15		1%
CONSTRUCTION INDUSTRIES	202		14%	
OTHER		9		1%
BUILDING DEVELOPERS		72		5%
TRADE CONTRACTORS		121		8%
TRANSPORTATION/COMMUNICATION/UTIL.	62		5%	
OTHER		9		1%
TRUCK		46		3%
TAXICAB		7		1%
WHOLESALE	36		2%	
RETAIL TRADE	426		29%	
OTHER		2		1%
FOOD/BEVERAGE/PHARMACY		61		4%
CLOTHING		45		3%
SPORTS/SPORTING EQUIPMENT		15		1%
APPLIANCE/FURNITURE		49		3%
GASOLINE		8		1%
MOTOR VEHICLE REPAIR/MECHANICAL		69		5%
AUTO DEALER		12		1%
MUSIC STORE		3		1%
FLORISTS		15		1%
HARDWARE		33		2%
JEWELRY/CRAFT/PHOTO/MISC.		114		8%
REAL ESTATE OPERATIONS	44		3%	
INSURANCE AGENTS/FINANCE	58		4%	
BUSINESS AND PERSONAL SERVICES	529		36%	
MANAGEMENT CONSULTING		64		4%
HOTELS/MOTELS		16		1%
RESTAURANTS		118		8%
BARBERS/BEAUTY/FIGURE SALONS		45		3%
LAUNDRIES		9		1%
MACHINERY AND EQUIPMENT RENTALS		15		1%
WELDING		6		1%
SERVICES TO BUILDINGS & DWELLINGS		75		5%
TICKET AND TRAVEL AGENTS		3		1%
PERSONNEL/COMPUTER/BOOKKEEPING/ADVERT.		36		2%
ARCHITECTS & ENGINEERS		17		1%
SOCIAL SERVICES/HEALTH CARE		37		3%
AMUSEMENT AND RECREATION SERVICES		16		1%
OTHER BUSINESS SERVICES		24		2%
OTHER PERSONAL SERVICES		12		1%
FARMING OPERATIONS	22		1%	
AQUACULTURE	14		1%	
TOTAL	1,472			

*Some totalling differences occur because of rounding.

BUSINESS START UP SUMMARY
JANUARY 1 - JUNE 30, 1988



BASELINE, 1988

For the purposes of this study, we randomly selected approximately 200 firms from this listing for inclusion in this sample. These represent the new business grouping. At the direction of the Steering Committee, we selected firms within classifications with the greatest likelihood of contact with the Science and Technology Transfer Network. It was essential to use only those with some need for information for scientific and technological information if the mission was to evaluate the transfer of that information.

Baseline staff also developed a listing of firms who had received assistance under the Industrial Research Assistance Program (IRAP), or the Industrial Innovation and Technology Development Sub-Agreement. Lists of grantees were cross-referenced and this in turn was again cross-referenced to the listing of the 100 largest manufacturers in this province. Firms which were eligible for inclusion in this survey met one of the following conditions:

1) a firm was one of the 100 largest manufacturers;

2) a firm had been funded for at least two years under IRAP and/or received funding under the Industrial Innovation and Technology Development Sub-Agreement;

3) a firm had been listed in the Directory of Private Sector Companies Performing Research and Development in New Brunswick, 1987; or

4) a firm had been mentioned as being innovative by a supplier of information in the network.

From the total listing we selected a sample of 350 firms.

These 350, along with the list of innovative firms identified through suppliers, provided the number needed to complete the total of 300 interviews (the total completed through personal and telephone interviews in addition to the supplier interviews).

While the method of sample selection does limit

the scope of inference - for example, this information collected cannot be said to represent the views of the overall business community - they can be interpreted to reflect the views of those most likely to be involved in either information transfer, research and development, or some other aspect of innovation. They also represent that group of businesses which has either had the greatest degree of contact, or has had the greatest potential need for contact with the suppliers.

In this research it would be very difficult, given the combination of personal and telephone interviews to cite a specific level of accuracy for all material collected. It can be said, however, that the information collected complied with those rules of research which provide the greatest probability of collecting accurate information:

1) A random selection procedure was used for the telephone survey and most participants received a letter letting them know about the study and its purpose.

2) Interviews were conducted in either official language - the choice was made by the respondent.

3) Each participant was assured of complete confidentiality in order to provide the type of atmosphere needed for a frank and open discussion.

The combination of approaches summarized above provided the scope and type of information needed to evaluate the reach of the system in place and to evaluate the need or demand for service which can be found in the marketplace.

The following material presents the information collected through this research effort.

2.0 THE SUPPLIER NETWORK

2.1 INTRODUCTION

The following provides a summary of information related to the current STITN in this province. This information begins with a summary of current policy, followed by a brief discussion of the suppliers. The summary of the services provided by each firm is included in Appendix A. This section also contains a summary of the observations of the interrelated contacts of the members of the network and the findings drawn from these interviews. Only those observations which have been stated repeatedly or which represent the views of a particular group are presented. In no instance do these comments reflect the opinion of any one person.

2.2 GUIDING POLICIES

THE FEDERAL GOVERNMENT

The National Science and Technology Policy, signed in March 1987 by both levels of government, was the first policy statement of the federal government dealing solely with science and technology. Its adoption indicated general agreement that science and technology were playing roles of increasing significance to Canadian society, not only

in the advancements and benefits they offered, but in the challenges they raised to existing patterns of work. Challenges were also issuing from the efforts of other countries to stimulate scientific and technological progress resulting not only in improved living standards but in increasingly competitive trade. This national policy signalled a clear commitment to research, development and innovation in Canada, by both Ottawa and the provinces.

The National Science and Technology Policy took explicit note of problems of regional development by underscoring the role that science and technology could play in the expansion of local economies.

Aside from pledges of coordination, cooperation, and partnership with the various participants in the field of science and technology, such as universities and other levels of government and industry, the policy listed six elements believed to be key areas requiring attention, in addition to the

seventh element of regional development.

To implement this policy, a Council of Science and Technology Ministers from the thirteen governments of Canada was established. The Council's activities included encouraging consultation on science and technology policies being brought forward by individual governments, identifying programs that might be pursued cooperatively, suggesting amendments to the National Science and Technology Policy and receiving the reports of the seven working groups organized around the seven elements of the national policy.

In addition, the Prime Minister established the National Advisory Board on Science and Technology (NABST) to advise him and the federal government on science and technology policies. This forty member advisory board, composed of representatives from a wide variety of scientific fields, is chaired by the Prime Minister.

Shortly after this national policy statement was released, a federal government strategy called InnovAction was announced. This strategy focused the government's science and technology policy on five critical areas: 1) industrial innovation and technology diffusion; 2) development of strategic technologies; 3) effective management of federal science and technology resources; 4) human resources for science and technology; and 5) public education in science and technology. These categories were further divided into critical sub-categories. For example, the first category, Industrial Innovation and Technology Transfer was subdivided into small business and technology, acquiring technology from abroad, improving our technology centres and enhancing procurement policies.

As a further indication of the federal government's interest in science and technology, two federal departments, Ministry of State for Science and Technology (MOSST) and the Department of Regional Industrial

Expansion (DRIE) were merged with their responsibilities transferred to the new Department of Industry, Science and Technology (DIST).

As far as the provinces are concerned, federal policy gets attention when it is funded. Lines of funding science and technology programs into the provinces have been established at many points. The Industrial Research Assistance Program (IRAP), administered by the National Research Council, has been very successful. In addition, there are regional assistance programs which have been tailored to meet specific situations. The 1984 Economic and Regional Development Agreement (ERDA), a joint federal-provincial agreement, gave rise to such specific initiatives as the Canada - New Brunswick Subsidiary Agreement on Industrial Innovation and Technology Development (1986-1991) which provided for specific program funding within its defined area.

PROVINCIAL GOVERNMENT

The provincial government of New Brunswick, unlike the federal government, has no publically available policy detailing the development of science and technology initiatives within the province. A 1982 publication of the Department of Commerce and Development outlines a strategy for the development of manufacturing in the province and mentions the contribution that new technologies can make to industrial development. Six priority areas are identified where the application of new technology would be most fruitful. They are: forestry and forest products; oceans and marine transportation; metallurgy; energy; health care sciences; and agriculture.

Industrial diversification is seen as essential for the development of the manufacturing sector in New Brunswick. The introduction of new technology is a key method of accomplishing this diversification. The New Brunswick

government supports an economic development policy, one purpose of which is to provide economic incentives to major projects that will introduce advanced technologies into the province in the non-resource based sectors.

In addition, two aspects of technological development are noted; adoption of available technology is seen as a means of improving productivity of existing firms. The second aspect relates to the development of new technologies which might lead to the expansion of existing or the establishment of new firms. It is noted that the Province will place high priority on research and development which can be applied directly to new manufacturing activities in the province.

2.3 THE SUPPLIER GROUP

According to the Terms of Reference and the Department of Commerce and Technology, there are 23 suppliers (nodes) in the existing Science and Technology Information Transfer Network. During the course of contact with each of these suppliers, we were able to develop a basic profile

of the services offered, the type of client served, the fees charged and related information. As noted earlier, this information is included in Appendix A.

During these interviews, questions were also asked to determine the frequency of contact between members of the network. This information is summarized in a communication netwrok which is also presented in Appendix A.

The key point of this aspect of the research involved the solicitation of input from members of the network concerning the flow of information and the type of informational or service needs sought by the business community. That information is presented in the following section.

2.4 RESEARCH FINDINGS FROM THE SUPPLIER NETWORK

During these interviews, each participant was asked about their system for service delivery, the demands of the marketplace as well as other issues related to the STITN (please refer to Appendix B to review the interview schedule). These interviews provided the basis for the following statements:

1) Most of the suppliers contacted suggested that they had the capacity to meet more demand than was present at this point, although a few suggested that lack of funds did affect their operation - they might not, for example, be able to provide the quality of service they wanted or be able to maintain as extensive an information data base as they should have. Suppliers who claimed to be at or close to their maximum service level included the Huntsman Marine Science Laboratory and the Federal Department of Fisheries in St. Andrews. Some services at RPC also appear to be at maximum capacity.

When surplus capacity was noted, a lack of demand, service duplication/confusion or a lack of promotion were most often cited as reasons for the lack of demand.

2) Several contacts noted that the network is highly competitive and thus not conducive to cooperation between members. This competition also relates to a lack of demand for some of the services available to the

overall business community. Others noted that the competition for clients also produced confusion within various sectors of industry. For example, several suppliers noted that people representing different agencies are calling on the same client offering related services and yet not working coperatively with the others to most effectively solve the problems of the business. It seems to be becoming an issue of 'ownership of clients' rather than 'services to clients'.

3) There does not seem to be any organized approach to the development of this network. Different nodes are developing independently with little cooperation. For example, the three libraries in the univerities all have separate cataloguing systems, making linkages somewhat difficult or cumbersome. This limits access to regional informational sources. Another example is the fact that two of the major service deliverers involved in supplying information and assistance to innovative firms claim to be unsure of what

the other is doing - and yet both are approaching the same clients and both have similar missions. Recent efforts to merge the boards of CADMI and MTC suggest action to try and correct some of the problems which may exist.

4) There is a fairly strong sentiment that the network has no leader. No firm, agency or person seems to have emerged, or been given the authority or primary responsibility for developing or directing activities within the STITN. One firm did claim to have primary responsibility for client contact, but that claim did not seem to be supported by others in the network or by the business community as a whole.

5) Each of the suppliers interviewed suggested that their strengths rest in their expertise and experience in particular fields. Some, but certainly not all, suggested that they were able to grasp the needs of the industry, and had a good understanding of what would be useful to particular sectors of the economy.

6) When asked what their areas of weakness were, the overwhelming response noted the lack of visibility or lack of promotion of their services. Many suggested that they simply had not gotten their message to the private sector.

7) Others suggested that the lack of cooperation among suppliers involved with providing information related to science and technology was also a major weakness in this system. The lack of direction and lack of governmental commitment to the development of this network and the lack of identifiaction of members with the network were cited as major inhibitors to the full development of this network.

8) Based on the information collected, there seem to be four types of clients who are recieving services or coming into contact with this network:

a) the large or medium size firm that knows what is needed and is able to seek

out and find the information. This firm is also often able to pay for the service provided if payment is necessary.

b) the more innovative firms, often small firms, trying to develop or put in place a new technological process or seeking specific information related to some change being considered;

c) the firms which are able to implement some of the changes needed but which could also benefit from additional information or assistance.

d) those firms which are unable or somewhat unaware of their needs and the potential impact of scientific and technological change on their operations.

Interviews with suppliers suggest that:

--large firms are readily able to get

what they need - if they choose to want the information.

--small innovative firms generally gain access to the specialized information and resource people they need, but they have difficulty in initially finding the specialists and information.

--the medium sized manufacturing company is likely to have been contacted by one of the funding agencies (NRC, RPC or C&T) but that contact may not have provided up to date access to the type of information needed.

--some of the more innovative firms are far more likely to be relying on a variety of technical information sources from outside New Brunwick than on STITN simply because the expertise is not available within the network or within this province.

--According to the information provided

by suppliers, it is estimated that slightly more than half of the businesses which come into contact with this network would be considered to be technologically competent.

9) According to information collected in these interviews, there is a need to present information in a way which can be understood by business - in both a terminology and format which enhances rather than restricts the absorption of information.

10) Along with the level of technical or technological competence, several members of the network also suggested that the business community of New Brunswick is not yet at the level of innovation or technological advancement in which it can make effective use of the services available. For example, the application of industrial engineering and microelectronics requires a relatively high tech industrial base which has not yet been developed.

11) While some note the lack of use and demand, others suggest that the network is really building for the future. It is providing the employment and service base for future economic development. It is, in fact, setting the infrastructure in place for the future. However, these and others suggested that one of the major weaknesses in this system is the absence of a major high tech firm to create more business spin offs. The frigate program in Saint John does not appear to be providing the same level of benefits as the Pratt and Whitney operation seems to have had in Nova Scotia. To that high tech firm seeking New Brunswick suppliers it may seem that the services are not available and that may be the case, but over the long run someone will have to make a commitment to the development of support services/businesses if the industrial and service sector is to develop to its full potential.

3.0 THE SURVEY OF INNOVATIVE BUSINESSES

3.1 INTRODUCTION

As noted elsewhere in this report, an important part of this study involved a survey of businesses in this province in order to assess their needs in relation to scientific and technological information. Related to this overall objective were several sub-objectives. For example, business were asked about their contacts with the STITN network, their contacts with other businesses, the ratings of the services available to them and their suggestions on ways in which the system of transferring scientific and technological information could be improved.

The following material summarizes the information collected through contacts with 290 businesses in this province. These contacts were made through both telephone surveys and personal contacts.

Before making general statements about the overall business community, the reader should recall the information presented on pages 12 and 13 of this report. This study was not designed to be a study of all businesses in this province - it is a

study of those businesses likely to be among the more innovative: it is a study of larger or newer businesses and of businesses which have already come into contact with the services available through various levels of government.

If one is interested in measuring the overall reach of government programs and services, one could consider this group of businesses as those most likely to have the highest level of contact, other business groups or divisions are likely to have less contact than these businesses.

In this survey, the spokesperson for each business contacted was either the owner, the general manager or one of the people who was the head of engineering or research and development.

The balance of the material in this section presents a discussion of the characteristics of these businesses, the information collected from them and the suggestions they presented concerning the more effective transfer of scientific and technological information.

3.2 CHARACTERISTICS OF THE FIRMS

The telephone survey was conducted with firms having the following characteristics:

TABLE 2
BUSINESS CLASSIFICATIONS

SIC CATEGORY	PERCENT
AGRICULTURE - AQUACULTURE	7%
MINING	3%
FOOD MANUFACTURING	15%
WOOD/TEXTILE MANUFACTURING	15%
PULP AND PAPER	3%
METAL- FABRICATION	19%
TRANSP - MANUF	4%
ELECTRICAL - MANUF.	4%
PLASTICS/GLASS	2%
CHEMICAL INDUSTRY	2%
OTHER MANUFACTURING	4%
CONSTRUCTION	5%
TRANSPORTATION - UTILITIES	3%
CONSULTING	12%
OTHER	2%
	100%

Consistent with the information in Table 2 is the fact that most businesses, when asked, claimed to be providing a product (60%) rather than a service (19%). The balance claim to provide both a service and a product. This represents a significant difference from the overall pattern for the New Brunswick business community provided in Section 1.

TABLE 3
YEAR OF BUSINESS START-UP

YEAR	PERCENT
BEFORE 1960	20%
1960 - 1974	23%
1975 -1985	37%
1986 - 1988	21%
	100%

TABLE 4
AVERAGE NUMBER OF EMPLOYEES

NUMBER OF EMPLOYEES	SAMPLE	N.B. BUSINESS
FIVE OR LESS	23%	74%
6 - 10	13%	13%
11 -20	16%	7%
21 - 50	16%	4%
51 - 100	12%	1%
MORE THAN 100	20%	1%
	100%	100%

As can be seen in these tables, the firms which appear to come into direct contact with the system tend to be somewhat larger than average and appear to have been established for a significant period of time: 46% of these firms were established before 1975.

Participants in this study appeared to be very interested in the research topic once they began the actual interview: on average a telephone interview lasted 28 minutes. However, it was necessary to contact over 500 businesses to complete the required number of interviews.

3.3 RESEARCH FINDINGS: INFORMATION SOURCES FOR NEW BRUNSWICK BUSINESSES

In the telephone and personal interviews, each business representative was asked about their sources of information for scientific and technological information.

According to the information collected, most businesses do not see trade publications and journals as their primary source of information. For example, while most received some type of business - to - business publication, 42% claimed that there was no particular trade journal or publication that they would cite as an important source of information about the application of science and technology.

Those firms which did claim that trade publications and journals were an important source of information mentioned journals or publications in the following areas: engineering (15%), computer design/hardware/software (10%), construction or architectural trades (9%), food publications (9%), forestry publications (8%), and aquaculture (5%).

Unlike trade publications and journals, the manufacturer or sales representative does play a strong role. Approximately 65% of the firms see these people as somewhat or very important sources of information related to technological change. The interviews also revealed that people are aware of the possible conflict between supplying information and wanting to sell a product, but several also noted that there were sales reps who seemed more concerned about their (the respondent's) business than about selling a particular item. This was most commonly associated with sales reps for chemical companies who called on the businesses in this study.

In the process of analysis, it was interesting to note that the importance attributed to sales reps was also related to the size of the firm. For example, the larger the size of the firm (number of employees) the higher the importance assigned to sales reps.

When respondents were asked to select one type of supplier as their primary source for updated information related to technological change or

innovation individual business contacts play a major role in the transfer of information. The overall summary of responses in presented in below:

TABLE 5
MAJOR SOURCES OF INFORMATION
ON TECHNOLOGICAL CHANGE AND INNOVATION

SOURCE OF INFORMATION	PERCENT
OTHER BUSINESSES	17%
MANUFACTURER/SALES REPRESENTATIVES	17%
CONFERENCES/SEMINARS	12%
TRADE PUBLICATIONS/ JOURNALS	11%
GOVERNMENT AGENCIES	7%
UNIVERSITIES	3%
COMBINATION OF SOURCES	33%
	100%

In this study, each respondent was asked how important they thought access to updated information was and whether they believed that their company was as up-to-date as it could be. This information is presented in Table 6 and Table 7.

TABLE 6
RATING OF THE IMPORTANCE OF
ACCESS TO INFORMATION

RATING	PERCENT
VERY IMPORTANT	66%
SOMEWHAT IMPORTANT	27%
NOT VERY - NOT AT ALL IMPORTANT	7%
	100%

TABLE 7
RATING OF THE COMPANY'S LEVEL OF AWARENESS OF CURRENT INFORMATION

RATING	PERCENT
THE COMPANY IS AS UP TO DATE AS POSSIBLE	37%
THE COMPANY IS SOMEWHAT UP TO DATE	54%
THE COMPANY IS NOT VERY UP TO DATE	9%
	100%

In analyzing this material, it was noted that there was no significant relationship between the rating a representative gave to his/her company in terms of current information and the importance given to access to information. There were also no differences in importance ratings among firms of different sizes.

When they were asked to describe the type of information related to science and technology which would be most helpful to them in becoming more innovative, 21% said that they would like information related to new manufacturing processes or improvements in existing processes; 12% were interested in up to date information on any changes in equipment, 10% were interested in

obtaining information on materials and 10% expressed interest in information on computer applications for their business. This should be considered fairly consistent with the manufacturing orientation of these firms.

All respondents were asked two additional questions which implied some type of rating of the information services available. Each were asked who they thought was most able to provide useful business information and who they believed was most able to provide useful scientific and technological information. The following table demonstrates the participants responses:

TABLE 8
MOST USEFUL SOURCES OF INFORMATION

	BEST BUSINESS INFORMATION	BEST S&T INFORMATION
PRIVATE SECTOR	47%	38%
GOVERNMENT FUNDED AGENCIES	11%	15%
PROVINCIAL GOVERNMENT	12%	9%
FEDERAL GOVERNMENT	7%	10%
UNIVERSITIES	4%	11%
COMBINATION OF SOURCES	19%	17%
	100%	100%

There is not a significant difference in the perception of these different sources of information among the larger and smaller firms:

most see the private sector as the best source of information followed by the types of agencies included in the STITN.

NETWORK CONTACT SUMMARY

Along with asking about the different sources of information, each firm's representative was asked if s/he was familiar with some of the services available, if they had come into contact with the services available, what type of assistance they wanted from a particular agency, how they rated the service they received and what suggestions they might make to improve the services offered.

The following tables provide a summary of this information.

TABLE 9
LEVEL OF FAMILIARITY WITH
EXISTING SERVICES

DEPARTMENT OR AGENCY	LEVEL OF FAMILIARITY		
	VERY FAMILIAR	SOMEWHAT FAMILIAR	NOT FAMILIAR
COMMERCE AND TECHNOLOGY	42%	36%	22%
R.P.C.	39%	32%	29%
A.C.O.A.	38%	33%	29%
N.R.C.	27%	38%	35%
D.R.I.E./ D.I.S.T.	26%	35%	39%
INDUSTRIAL DEVELOPMENT COMMISSIONS	22%	25%	53%
C.M.A.	22%	23%	55%
M.T.C.	8%	15%	76%
U.N.B. - C.A.D.M.I.	10%	11%	79%
U. DE M. - C.A.D.M.I.	6%	11%	83%
INNOVATION CENTER	4%	8%	88%
INCUBATION CENTER	4%	4%	92%

Once it was determined who was familiar with the different service providers, respondents were asked several questions about those organizations with which s/he was familiar. The additional information is summarized below.

TABLE 10
RATING OF SERVICES
RECEIVED

DEPARTMENT OR AGENCY	RATING			
	EXCELLENT	GOOD	ONLY FAIR	POOR
COMMERCE AND TECHNOLOGY	45%	46%	8%	1%
R.P.C.	43%	49%	5%	3%
A.C.O.A.	46%	40%	9%	5%
N.R.C.	44%	44%	8%	4%
D.R.I.E./ D.I.S.T.	20%	68%	10%	2%
INDUSTRIAL DEVELOPMENT COMMISSIONS	52%	39%	7%	2%
C.M.A.	27%	63%	10%	--
M.T.C.	39%	54%	7%	--
U.N.B. - C.A.D.M.I.*	27%	46%	27%	--
U. DE M. - C.A.D.M.I.*	11%	67%	22%	--
INNOVATION CENTER *	68%	32%	--	--
INCUBATION CENTER *	33%	67%	--	--

*The number of firms who came into contact with these organizations was very small.

The following tables summarize the ratings given to the services provided, demonstrate how various businesses came into contact with these organizations and the type of help or assistance they were initially seeking from these organizations.

TABLE 11
CONTACT WITH AND INITIAL INFORMATION OR SERVICE NEED FOR FIRST CONTACT

DEPARTMENT OR AGENCY	% CONTACTING	SOURCE OF INTIAL INFORMATION	INITIAL REASON FOR CONTACT
COMMERCE AND TECHNOLOGY	40%	Through other business associates Industrial develop -ment Commissions C&T approached firm	Money for equipment Money for expansion Money for business start Information
R.P.C.	33%	R.P.C. Approached firm Comm/Tech referred Long term awareness	Technical information Money for product development To improve manufacturing efficiency To do "lab work"
D.R.I.E./ D.I.S.T.	14%	Through media Through Personal approach by Firm Business associates referred	Looking for money - general Money for equipment or expansion General information
A.C.O.A.	28%	Through various media Commerce/Tech referral Through Personal approach by firm	Money for business expansion Money for new equipment Money for product development
M.T.C.	6%	Business associates referred Personal approach by firm	Assistance with product develop. Staff training Technical information

TABLE 11
CONTACT WITH AND INITIAL
SOURCE OF INFORMATION LEADFING
TO FIRST CONTACT
(CONT.)

DEPARTMENT OR AGENCY	% CONTACTING	SOURCE OF INTIAL INFORMATION	INITIAL REASON FOR CONTACT
INNOVATION CENTER	4%	Business associates referred	Technical information Informaion and development
INCUBATION CENTER	2%	Through staff contact	Development assistance
N.R.C.	25%	Through R.P.C. referral Through business associates N.R.C. approached firm Long term awareness	Technical information Information on other programs Money for project or product development
C.M.A.	12%	Members of the Organization	General newsletter information Information on industrial developmnent
U.N.B. - C.A.D.M.I.	4%	Through Business associates	Technical information/assistance Assistance with product development
U. de M. - C.A.D.M.I.	3%	Through business associates	Assistance with product development Searching for $ for development
INDUSTRIAL DEVELOPMENT COMMISSIONS	12%	Through business associates The commission approached the firm.	Information of programs available General newsletter information Searching for $ for development

The information presented in these tables does suggest that the reach of the network to the business community, at this point, is fairly limited.

The information presented above does demonstrate the different uses businesses associate with each of the services available.

Along with this search for a better understanding of how information can be transferred to the business community, each respondent who has come into contact with one of the nodes in this network was asked what suggestions they would make to improve the service they had received. The following material summarizes respondents' suggestions for improvement. Suggestions have not been provided for all suppliers because some of the businesses had very limited contact with a particular agency.

COMMERCE AND TECHNOLOGY

Those who had received services from Commerce and Technology indicated that the major improvement that should be made would involve the steps needed to speed up the way in which the service was provided. They also suggested that it would help if they did not get the "run

around" when they requested information. Some also suggested that it would be helpful if staff at Commerce and Technology began to think in a more entrepreneurial mode. The final comment suggests that the forms used by Commerce and Technology could be greatly simplified.

RESEARCH AND PRODUCTIVITY COUNCIL

Those who had received services from R.P.C. suggested that service could be improved if service delivery were provided more quickly. Others suggested that the services provided by R.P.C. were too expensive - were the fees for service reduced, the service would improve. Others suggested that R.P.C. should stop competing with the private sector. The final comment suggests that R.P.C.'s service could be improved if its follow-up was improved.

A.C.O.A

Among those who had received services from ACOA, only one suggestion was really given which would improve the service: the proposals should be processed more quickly.

INDUSTRIAL DEVELOPMENT COMMISSIONS

The only suggested change which would improve the Commissions, was that there should be more follow-up on the services provided.

As a final point in the evaluation of services provided, all respondents were asked to select the one department or agency which seemed most capable of answering the types of questions they had

concerning scientific research or technological change. Forty percent of all respondents indicated that no one agency or department seemed more capable of answering their questions than any other. R.P.C., Commerce and Technology and the N.R.C. were most frequently described as most capable of answering the type of questions they might have.

All respondents were also asked to describe the type of program or services they would like to see put in place to assist them in doing a better job of keeping up with current information and innovation. Among survey respondents, 50% had no specific suggestion for a new program or service. Among those who made some suggestions: 14% indicated a desire for more seminars and conferences at which they could receive up to date information; 13% noted a need for better access to the types of data bases available through libraries; 9% suggested that it would be helpful if they could have better access or information sharing with expert resource people; an additional 6% suggested that it would be helpful if they could receive up to date information on computer applications.

In summarizing the information collected through this survey it was noted that on average, the firms in this study have come into contact with two nodes in this network. Among all firms, 29% actually had no contact in the past two years; 22% had come into contact with one of the nodes in this network and 49% had come into contact with two or more service providers. This does confirm information from suppliers which suggests that their reach is somewhat limited and perhaps provides the basis for duplication of contact.

As a final point in trying to understand the informational needs of business, each respondent was asked two questions. First of all, they were asked what could be done to make it easier for businesses to gain access to up to date scientific or technological information. Secondly, they were asked what they thought of the idea of a one stop information center for scientific or technological information. The following tables summarize responses to these questions:

TABLE 12
METHODS OF INCREASING ACCESS
TO INFORMATION

PRIMARY SUGGESTION	PERCENT SUGGESTING
CENTRAL REFERRAL/ ONE STOP SHOPPING	20%
DIRECTORY OF INFORMATION FOR CONTACTS AND PROGRAMS	18%
ACCESS TO DATA BASES	14%
DIRECTORY OF INFORMATION FOR CONTACTS AND PROGRAMS	8%
ABSTRACTING SERVICES	7%
CENTRAL LIBRARY	7%
INDUSTRY SEMINARS	7%
NO PARTICULAR SUGGESTION	36%
	100%

TABLE 13
LIKELIHOOD OF USING INFORMATION CENTER

LIKELIHOOD	PERCENT
VERY LIKELY	66%
SOMEWHAT LIKELY	23%
NOT VERY/NOT AT ALL	11%
	100%

This survey also asked a few questions about the level of research and development activities within business. This information is summarized below.

3.4 RESEARCH AND DEVELOPMENT ACTIVITIES

Among firms in this study, approximately 58% claimed to be involved in some type of research and development activities within their organizations. When asked what percent of total operating budget was allocated to R & D, 33% claimed to be allocating less than 2% of their total budgets, another 40% claimed to be allocating from 3 - 10% of their total budgets to R&D and the balance, about 27%, were allocating more than 10%. While, on average, 13% of of a total operating budget was allocated to R&D, one should be cautioned to note that 12% of the firms in this study were consulting firms, many of whom claimed to allocate a very high percentage of their budgets to R&D (above 50%).

The firms in this study seem to see themselves as fairly isolated. For example, when asked if there were other firms in the province working in their area of research, 51% claimed that there were no other firms and 30% claimed that there were only a few other firms working in their area.

When asked about the frequency of contact with

other firms working in a similar area, approximately 70% of these businesses claimed to have infrequent or no contact. It is interesting to note that the information collected from some of the suppliers also suggested that they were in limited contact with others - and when they were in contact, it was often with people from outside the province.

It would seem that the firm involved in R&D in this province is somewhat isolated and would appear to have a need for additional contacts for updated information or innovation.

SUMMARY OF SURVEY INFORMATION

The information collected in this survey has provided a summary of the informational needs of new or innovative businesses in New Brunswick. The results of this survey suggests that most business people work in a fairly isolated environment with little time for the type of activities needed to remain as up to date as possible on relevant scientific and technological information. The results also suggest that businesses recognize their problems and are receptive to new ways of receiving information.

The preceding material has summarized the information sources and needs of some of the more innovative members of the business community. One of the key observations which must be made is as follows: while many information suppliers are in place, the business person continues to rely on other firms and business contacts as their most important source of information.

The material collected in this survey provides the substantiation needed for the implementation plan which is presented in detail in Section 4.

4.0 IMPLEMENTATION PLAN FOR THE SCIENCE AND TECHNOLOGY INFORMATION TRANSFER NETWORK

4.1 INTRODUCTION

The primary purpose of this research effort centered on the development of an Implementation Plan to ensure the more effective transfer of scientific and technological information from those who have or produce information to those businesses which can benefit from that information. The material below, which provides a detailed presentation of Baseline's suggested approach to improving the quality of information transfer in this province, is based on the following:

1) a review of existing resources;
2) the responses from personal and telephone contact with users; and
3) the comments and suggestions from the suppliers of services.

Before the actual discussion of the plan, the applicable information drawn from this research effort is summarized. Next, the components of the plan are outlined and the needed changes and implementation schedule are presented.

4.2 APPLICABLE INFORMATION DRAWN FROM THE RESEARCH EFFORT

Effective communication means that the message sent and the message received have the same meaning. Failure to achieve this results in an ineffective communication network. In order to develop an effective system in which communication occurs a first step must involve the development of a clear understanding of the factors which influence this system and the factors which must be taken into account when one attempts communication.

The information collected from the various aspects of this study have provided the essential background information which must be considered in developing a system of communication. This research suggests that the following points will have a direct or indirect influence on any communication network developed to enhance the transfer of science and technology related information.

1) The first and most obvious point involves the differing levels of ability, interest and

awareness of the people who could be sending or receiving messages. For example, the scientist may have some difficulty in transferring information to the businessperson, the politician, or the bureaucrat, and vice versa. This suggests a need to achieve a common ground between groups. This does not suggest an inequality, it simply suggests the need to recognize differing levels of expertise.

2) The business community in this province is relatively small, but demonstrates a wide variation in levels of innovation. Because less innovative firms could significantly benefit from learning about the work of others, a system which allows the sharing of information between related groups of businesses could make a significant contribution to upgrading the overall level of innovation.

3) While competition is characteristic of the business community, competition between members of the network is not a useful component of this network; this simply demonstrates the need for a directive or a system which encourages a more

collaborative effort in supplying the information needs of clients.

Related to this is the need to reduce or somehow coordinate the number of people attempting to provide services to the same company. Many suppliers are making regular business contacts, but there seems to be a need for a contact point or outreach system which is designed in the best interest of those who need the services offered. It should be noted that the most innovative firms have no difficulty in making use of the resources available (but they do have some concerns about service delivery); it is the less active firm which needs greater access to information and which may need more assistance.

4) The absence of knowledge about a specific provincial directive or strategy related to science and technology is impeding the development of a coordinated system. For example, there are very attractive components of the system, but their development has not been linked to existing services, nor has there been a directive related to coordination.

The concerns expressed about competition come from suppliers in the network as well as from the business community. There are groups within the business community which suggest that government should not be in direct competition with the private sector. Some of the complaints about competition from within the overall system could be eliminated if the roles of service providers were more clearly defined or a way was developed in which more than one supplier was allowed to service client needs. At this point there is no person or organization which has either assumed or been given the overall responsibility for leadership and coordination in the area of information transfer.

5) The different funding agencies have only recently made some of the types of decisions needed to clearly establish roles in the provincial system for the transfer of scientific and technological information. If the Implementation Plan is developed, the decision on who should be responsible for the implementation of the proposed system is a key point which will have to be addressed by those allocating resources

for implementation. The plan developed makes the necessary decisions. If a system is to be effective and supported, this has to be accepted by the Department of Commerce and Technology, ACOA, the NRC and other federal-provincial funding sources.

6) While many suppliers suggest that a significant percent of the business community may be somewhat limited in their knowledge of science and technology, it seems that it is a lack of time to absorb information, a lack of contact with appropriate resource people or a lack of opportunity to come into contact with innovators (or leaders) in the business community which may restrict the ability of the businessperson to become more aware of scientific and technological information. Any plan suggested should attempt to address these problems.

7) There is almost a universal assertion that more money is needed to fund the science and technology information transfer network. However, the prevailing attitude at the provincial level seems to suggest that this is a time for restraint

and more efficient use of resources. The plan presented will address this point through the presentation of a more coordinated approach. This plan does not attempt to address each need identified. For example, the three universities have three different cataloguing systems for their libraries. While a single system would seem to be the most logical approach, the agreement needed to put this in place appears to be difficult to achieve. For example, one of the universities has just made a decision to install a system which is different from the other two. Given that the people making the decisions were aware of this and yet still made the decision to go ahead, it seems unlikely that a recommendation concerning library systems from this project would serve any useful purpose. In these situations, specific recommendations have not been developed.

A similar, and yet different, situation can be found at R.P.C.. R.P.C. expressed concern about the need for additional resources to fund services. However, during the final stages of this project there was an award or allocation of approximately $20 million from A.C.O.A. to R.P.C.

Again, specific recommendations regarding funding levels seem inappropriate for this report. The recommendations in this report do assume that the allocation for R.P.C. has made some additional resources available for the transfer of scientific and technological information from R.P.C. to the business community.

It was not until near the end of this project that Baseline's staff were advised of the memorandum of understanding between the federal and provincial governments concerning additional resources for the Regional Industrial Economic Development Commissions.

In reality, this plan will address the basic need to convey information in the most appropriate way possible.

8) If all the components of the present network are to remain in place, it is fairly obvious that there will be a need for a more effective means of making contact with potential clients if some network members with only a few clients are to achieve even a minimal level of client service.

9) If a network is defined as a series of interrelated parts working together to make up a system of effective communication for the transfer of information, then such a system is not in place in this province. We have a group of information suppliers, some linked but most not, all of whom are trying to provide services to the business community of this province.

10) A small but vocal sector of the business community subscribes to the theory that there is an on-going conflict between the public and private sector in different service areas. The fact that this issue has not been addressed in policy statements only perpetuates the problem.

These points and others have been drawn from the specific comments made during this research effort and have been addressed in the Implementation Plan.

It is interesting to observe the similarity between some of the conclusions drawn from this research and some of those drawn from the A.D. Little study. For example, that study suggested

the following: the need for commitment and follow-through by a variety of partners; the need to set priorities; governmental management of a more effective delivery system for science and technology resources; the need to have research institutions work more closely to maximize potential; the need to recognize the fact that the industrial base is dispersed and varies widely from county to county; the need to better link science and technology resources; the strong need to significantly improve the level of coordination between suppliers/resource people; and the need to strengthen the links between the public and private sectors and between business and the university or research sectors.

Based on the information collected through this research and through the Little study, Baseline is proposing that the Implementation Plan be founded on several components. Those components and the plan are discussed in the following material.

4.3 COMPONENTS OF THE IMPLEMENTATION PLAN

Based on the information collected, Baseline recommends the following to achieve a more

effective transfer of scientific and technological information:

STRATEGIC DIRECTION

If the implementation plan suggested below is to be effectively put in place, it is essential that those who make funding decisions agree to the plan and make their decisions in accord with the plan's recommendations.

The A. D. Little study was recommended to the government as the Science and Technology Strategy for New Brunswick. If that is the accepted strategic plan for the province, then it would be helpful if this were adopted, implemented and publicized at the appropriate levels. This defines the services to be made available and the role each component plays in the overall network. Additionally, the strategic plan would then define the relationship between the different components of the system. Such action would address the need for collaboration in the provision of services. As some respondents

suggested: if the Provincial Cabinet was to endorse and clarify the overall policies and strategies related to the science and technology network in this province, there could be a significant improvement in the overall delivery system. The fact that additional isolated or competitive parts of the whole are developed does nothing to encourage cooperation.

As recommended in the A.D. Little study, strategic direction should also provide a basis for evaluating the effectiveness of the various parts of the system. Baseline's work did identify weaknesses in the present system, but the purpose of this project was not to evaluate the existing services. However, there is a definite need to evaluate what has been put in place. For example, we would suggest that the current suppliers be divided into three different levels: basic science, business applications (testing and commercialization) and information transfer. Each of the different functions required at each level will necessitate separate measures

of evaluation. For example, it may not be appropriate to evaluate basic science through the number or quality of client contacts, but that may be the appropriate criteria for measuring the effectiveness at the information transfer level.

This evaluation should be incorporated into the funding decision. The criteria by which effectiveness is to be determined should be established at the onset, not midway through or at the end of a funding cycle.

This strategic direction should also clarify the role of the public and private agencies. The areas of conflict should be identified and decisions should be made. Once made, they will ease the tension and, we suggest, improve the overall situation.

BASIC SCIENCE COMPONENT

In any field of scientific endeavor one has to recognize the need for a basic or pure research foundation. This recognition ensures that the researcher who provides this

type of service is measured by appropriate criteria. In this province, this would seem to be the type of research conducted within university facilities, federal government departments or laboratories and specialized institutes. This does not suggest that other types of research are not conducted by these organizations, but that the basic research is ongoing. It does not address the expansion of this component or any other aspects except to suggest a means of conveying appropriate basic science information ultimately to the general business community.

It does seem appropriate to suggest that there is a need to address the way in which funding is made available to these facilities at the provincial level. If funding sources accept the reality of the scientific and technological development of the business community in New Brunswick, such development clearly requires a core of basic research.

In that case, funding for universities and institutes would become more direct and

clear.

For this project, the key point is to ensure conveyance of the appropriate information generated from basic science, to the next level in the network.

BUSINESS APPLICATIONS

This component of the system can be subdivided into two sections: testing and commercialization.

Applying the principles of both scientific research and new product development, the next series of activities which should take place within this system involve the development of product concepts and prototypes, when appropriate.

Some of the ideas at this stage may come from the basic researcher or they may come from innovators or entrepreneurs. The services which need to be provided should center on aspects of product development such as the possibilities of prototype development,

engineering and patent considerations and preliminary testing. The activities of this stage may, in a sense, determine the technical feasibility of the idea and suggest the need for further exploration.

In this stage, firms benefit from access to existing research and data base information.

If an idea or concept can be developed and needs further testing, the next stage of this process or component of the system, should involve services related to the potential commercialization or industrial application of the product/idea. For example, this could involve feasibility studies, estimates of market potential, market testing, development of additional financing, possible management resources or other support services for new firms, as well as a variety of other services.

At this stage, key participants or suppliers include all components of the Science and Technology Information Transfer Network,

other than those exclusively involved in the pure or basic sciences.

In this stage there is also a need for a systematic approach to the application of ideas or the transfer of information to the business community at large. This stage involves both the commercialization of products and the transfer of information to the larger business community.

For example, the product or process needs to be put into use if the prior testing proves positive. If necessary, there should be a full transfer to the private sector. The direct development role by government agencies should be significantly reduced but the funding of business ventures may continue or increase.

Each of the aspects of the research process outlined above has generated information which, if not proprietary or restricted for purposes of market advantages, could assist other businesses in this province.

Therefore, an important aspect of this system should specifically provide for the transfer of information developed through government assistance or related programs available from other sources to defined sectors of the New Brunswick business community.

A vital aspect of this component is to provide the opportunity for new ideas and opportunities to flow from this point back and forth through the system and to create an environment in which a greater predisposition to change and innovation can take place.

Again, most current suppliers are involved in this stage of change and innovation.

EVALUATION

The final component of this system should contain a process for evaluating the effectiveness of information transfer and expansion or innovation within targeted sectors of the business community.

This becomes a vital part of the process of

coordination and offers a significant contribution to making the necessary changes to a system which should be market driven.

The following material attempts to integrate the facts or components outlined, along with the needs identified in the research effort into an Implementation Plan for the transfer of science and technological information in this province.

4.4 IMPLEMENTATION PLAN

This research, as well as the A.D. Little study, suggests that there is a strong need for a systematic and managed approach for the development of an effective system of information transfer coordinated through the Science and Technology Information Transfer Network. Baseline's approach to the development of that system is presented in the following pages.

The plan we have developed is based on the following assertions:

1) We have attempted to develop a system

that will produce a network consisting of interconnected suppliers (nodes) which are working cooperatively to improve the access of small and medium size businesses to scientific and technological information.

2) We have attempted to develop a plan which is simple, concise and to the point. We strongly suggest that the time for further studies should end and the implementation should begin.

In this plan, the following activities are suggested for each of the stages:

SCIENCE AND TECHNOLOGY INFORMATION TRANSFER NETWORK IMPLEMENTATION PLAN

STAGES OF THE PLAN	COMPONENT OF THE SYSTEM
1. Policy formulation, adoption and coordination	Strategic planning
2. Coordination of support services and resources/ facilities	Testing Basic research
3. Development of regional business centers	Business applications
4. Development of information transfer process	Business applications
5. Development of an evaluation system	Evaluation

3) Our plan assumes that funding agencies are prepared to make the types of decisions needed to improve the transfer of scientific and technological information in this province.

An overview of the Implementation Plan we have developed is summarized in the following material.

IMPLEMENTATION PLAN
ACTIVITIES WITHIN STAGES

STAGE 1	REQUIRED ACTIONS	TIME	COST
Policy formulation, adoption and coordination	1) Governmental adoption of the strategic plan by cabinet	November-December, 1988	0*
Objective: to provide the overall direction and decisions needed to develop a more effective network	2) Establishment of inter-governmental liaison committee	December, 1988	0
Description: this process will not only provide direction, but will also coordinate the use of resources. If the funding agencies cannot agree to a plan, there is little hope that those competing for funds will be able to agree to a division of resources	3) Designation of the sponsoring agency for the implementation of the strategic plan	December-January, 1988	0
	4) Development of long term funding plan for resources by various funding agencies	Completed by April 30, 1989	0
	5) A process has to be established for input from suppliers which will be given the opportunity to define their relationships within this network - this is similar to the public hearing process. (Determined by Little study)	Completed by April 30, 1989	0

*If a '0' cost is assigned, it assumes that existing staff and resources will be used.

IMPLEMENTATION PLAN
ACTIVITIES WITHIN STAGES

STAGE 2	REQUIRED ACTIONS	TIME	COST
Coordination of support services and resource facilities Objective: to improve the coordination between the public and private sector and increase the overall level of R&D and innovation	1) The committee of funding sources should clearly define the services allocated to each organization being funded - and the funding sources should assume responsibility for avoiding conflict and eliminating duplication	Roles defined 6/30/89 Funding plan effective 9/1/88	-0-
Description: it is recommended that the coordinating group make specific recommendations concerning the services to be provided by the agencies being funded	2) Special conditions should be attached to each grant to insure compliance with establishment of regional offices	Clearly defined by 6/30/89	-0-
	3) Work between university administrators and funding sources to develop coordinated approaches to resource development and management - especially coorination of library resources (basic sciences)	Completed 8/30/89	-0-

(Continued)

4) There is a need to have an internal coordinating committee which will attempt to convey the basic and applied research activities to the appropriate industry and government sectors. This committee would become actively involved in the information transfer activities outlined in Stage 4	Designated 6/30/89	-0-

IMPLEMENTATION PLAN

ACTIVITIES WITHIN STAGES

STAGE 3	REQUIRED ACTIONS	TIME	COST
Development of regional business centres	1) Obtain endorsement of cabinet and coordinating committee for this approach	The BIC's should be established over a three year period, indicated below	
Objective: to improve business access, especially for small and medium size businesses, to information and resources related to science and technology	2) Designate service sites (research suggests Saint John, Moncton and Bathurst-Fredericton is served by central offices)	Year 1	237,300 (Moncton) (1 site)
		Year 2	711,900 (Saint John, Bathurst) (3 sites)
Description: throughout the research, there was evidence of an uncoordinated approach to business contacts. This approach attempts to establish a one-stop front-line information service. This does not purport to offer on-site scientific research	3) Assign or recruit office management staff and make funding decisions		
	4) Request staff assignments and schedules from each participating agency	Year 3	949,200 (Fredericton) (4 sites)
	5) Locate space - in conjunction with industrial development commissions if possible		
	6) Plan coordinating meetings for participating agencies		
	7) Develop marketing/business contact approach (responsibility for coordination should be assigned to site manager)		
	8) Monitor on-going progress	See attached discussion	

IMPLEMENTATION PLAN
ACTIVITIES WITHIN STAGES

STAGE 4	REQUIRED ACTIONS	TIME	COST
Development of information try sectors for seminars Objective: to provide an annual opportunity for large and small businesses from a particular sector to come together to share information and gain knowledge from contact with key leaders, academics and government ressources/services Description: these annual seminars for key sectors of the economy will be well organized, high powered and informative opportunities to learn what others are doing and to be informed about key trends in the field	1) Designate key industries at least fishing, manufacturing and forestry would be appropriate initially 2) Designate funding levels and staff coordinators for each area. The coordinators should come from the Department of Commerce and Technology. These should be paired with a private sector resource person 3) Staff should solicit input during planning stages from additional government and private sector resource people to locate most appropriate speakers 4) Each seminar should be held in conjunction with a trade show of private sector suppliers and government agencies supplying services to a particular sector 5) During the first year, no more than 3 seminars should be held - and they should last no longer than 1 - 1.5 days. They should also be held during non-peak seasons for the industry	Year 1 (2) Year 2 (4) Year 3 (4)	$40,000 $80,000 $80-90,000

IMPLEMENTATION PLAN
ACTIVITIES WITHIN STAGES

STAGE 5	REQUIRED ACTIONS	TIME	COST
Development of an evaluation system Objective: to quantify and measure the progress made in the implementation of services through the network Description: it is apparent that there is a need to better define and evaluate the services put in place. This could not only identify any underutilization, but could also identify duplications and propose more appropriate alternatives	1) It is recommended that the coordinating committee retain the services of an independent, out of province consulting firm to evaluate the progress achieved under this plan. The evaluation model should also include an evaluation of the overall network. Criteria should be developed by the committee and the consultant 2) It is recommended that this plan be evaluated two years after acceptance with a mid-term evaluation to test appropriateness of measures at the end of the first year		$75-100,000

The information presented on the preceding pages summarizes our approach to improving the science and technology information network in this province. We suggest that the following comments should serve to provide more detail in each stage of the plan.

STAGE 1: POLICY ADOPTION AND COORDINATION

Throughout the interviews and business contacts there was repeated mention of the lack of specific direction and responsibility for coordination. This approach suggests that there is a definite need for those who founded this system to begin to assume responsibility for more coordination and direction.

The key to success in this area will depend on the people and agencies who are assigned the primary responsibility for coordination. It is apparent that this will require the collaborative approach of the federal and provincial funding sources. We suggest that the question of leadership and direction is a cabinet level decision, perhaps negotiated

within the Office of Intergovernmental Affairs.

If coordination cannot be achieved at this level, the province may have to simply accept the fact that the system will be a network of independent parts with some parts coordinating their activities and others not.

STAGE 2: COORDINATION OF RESOURCES AND FACILITIES

This is closely related to the first stage but also, as a result of the interviews conducted, suggests the need to specifically address any duplication which may exist and clearly define the roles of agencies receiving funds. This does suggest that those who allocate the funds will define the services offered.

This should specifically address the concern about the public-private sector competition and should enhance the coordination between universities in this network.

STAGE 3: REGIONAL BUSINESS CENTRES-(BIC'S)

This stage is one of the cornerstones of the plan. It has been developed in response to the needs of both businesses and suppliers. This is recommended not because people are dissatisfied with the services they are receiving from various institutions, rather, because of the need to reduce costs and duplication of initial contact efforts. Especially in the personal interviews, comments were often made about the duplication of business contact, the level of competition for clients, the lack of coordination and the difficulty in establishing effective marketing efforts. From the business side there were also frequent comments about lack of knowledge about what is available or how to access needed information.

This concept of a BIC does not require the assignment of technical specialists or scientists to each site. It does, however, require the use of generalists with a

technical background to supply information and act as regional contact people. These contact people would be the key to the success of this program, along with the willingness of the key service deliverers (other members of STITN) to provide resource people on a periodic basis.

The following material presents an elaboration of the BIC concept.

RATIONALE: In today's business environment there is an ongoing need for access to information about change and innovation - information from the fields of science and technology.

The information collected through this research suggest that many have difficulty in accessing information and many suppliers have difficulty in reaching clients in a systematic and effective way.

The information also suggests that both

the business community and suppliers of services in this province could benefit from a one-stop information centre. If these centres could become known as an efficient and reliable source of information, this could significantly reduce the overall costs of support services, space and travel currently being borne by each agency independently.

It is apparent, from the information collected that the suppliers in this network have limited reach; however, within this context C & T, R.P.C., and ACOA had the greatest reach into the business community. Each of the suppliers also has its unique strengths, weaknesses and images. The BIC attempts to build on the strengths of those suppliers and coordinate the resources in order to make service delivery more effective and efficient.

BIC DESCRIPTION

The BIC would initially be established

in conjunction with three industrial economic development offices: Moncton, Saint John and Bathurst, (a fourth would be established in Fredericton in the later stages, if the program proved to be effective). These business organizations were chosen because of the recognition that these Commissions are established in their communities and their existing administrative set-ups. However, they were also chosen because of the recognition of the need to strengthen the services that these Commissions can provide in the area of scientific and technological information transfer.

While the BICs would be associated with the Commissions, they would be developed along the model set in place for the Innovation Centre. This model, however, would be extended to include established businesses.

BIC's would add a strength to these

central Commissions, consistent with some of the recommendations and models presented in the Price Waterhouse study of the Commissions. However, Baseline's concept suggests that the business community of this province is not large enough, lacks sufficient resources, or doesn't have sufficient demand to fund twelve Business Innovation Centers.

This BICs would also have space for field staff from ACOA, R.P.C., the Innovation Center, MTC, C&T and other federal and provincial agencies. Representatives of these groups should be required to use the BIC services facilities for local business contacts and should also be required to commit staff to BICs for at least one day every two weeks.

The crux of the service delivered through a BIC would be information. The employees of these centres should be business-oriented generalists who are

capable of finding information and providing direction for business problem-solving. Conceptually, the ideal staff backgrounds would involve direct business experience and an M.B.A.

These centres are not designed to eliminate any of the technical services currently in place, but are designed to eliminate some of the current duplication in outreach and business contacts. A BIC should also reduce some of the costs of travel, given a reduced demand for repeated visits to businesses. The reduced personnel demands on network suppliers should increase service capabilities in other areas, if staff can be reassigned. This should provide a more structured approach to outreach and business contacts in the more populated centres of the province.

Staff at a BIC would also be responsible

for the development and promotion of the services offered. This would produce a more directed marketing approach and enhance the overall level of visibility of business services. This addresses one of the major concerns identified by suppliers: lack of promotion or visibility.

PROJECT COSTING AND STAFFING

Building on the Innovation Centre model, each BIC would be staffed in the following manner:

POSITION	SALARY (RANGE)
REGIONAL MANAGER (1)	$35 - 50,000
INFORMATION SPECIALIST (2)	30 - 40,000
CLERICAL SUPPORT (1)	20 - 25,000

Each office would be allocated an annual operating budget in accord with the following: (This Budget is based on the assumption that basic office furniture can be made available through the local commissions or through resources of the Department of

Commerce and Technology or other agencies).

OPERATING COSTS

SPACE	$12,000
SUPPLIES ($ 300/MO.)	3,600
EQUIPMENT (LEASE ESTIMATED AT $600/MONTH)	7,200
TRAVEL	8,000
UTILITIES ($2000/MONTH)	24,000
INFORMATION MATERIAL (PRINTING AND RELATED COSTS)	10,000
RESEARCH COSTS - DATA BASE ACCESS (ASSUMING ONLY LIMITED USAGE)	10,000
PROMOTION AND P.R.	7,500
	$82,300

These budget projections are somewhat basic, however, they do provide a good indication of projected costs over an extended period. They are also based on a three year phase in the plan.

This budget is based on our conclusion that the existing network of suppliers of science and technology information can, and will, supply the needed information generated through BIC requests. BIC's, if implemented should free-up some of the current costs of outreach and market development activities and these monies can be reporgrammed by the information suppliers into service dollars.

While a need for information exists, it is highly unlikely that this concept would be able to operate on an economically independent basis. Rather, it is suggested as a part of the plan to provide access to information by businesses. Over the long run, it should replace outreach or contact activities being carried out by each member of the STITN and should eventually require a reallocation of budgets.

To summarize:

Year 1 - One Site

Cost per Centre:

Staffing	$155,000
Operating Cost	82,300
	$237,300

Year 1 Costs - 3 Sites	$711,900
Year 2 Costs - 4 Sites	$949,200

STAGE 4: INFORMATION TRANSFER

During the process of this research, it became apparent that those who were the more innovative usually had little trouble accessing information. They were often in contact with experts and had access to

updated information sources. However, it also became apparent that those in smaller businesses, those with less opportunity and less resources to keep informed, needed better access. Most firms also claimed to be operating in a relatively isolated environment.

It seems appropriate that a seminar format, if properly developed and implemented, could provide an excellent opportunity for business to become more informed. This also relates to the overall mandate to attempt to have a more innovative industrial or business base or climate in this province.

The approach suggested also provides the opportunity for the academic - scientific - government - private sector interaction which all parties claim would be of value in a format that could provide a great deal of information to a variety of business.

The key to the success of this stage is the ability of the organizers to get the best speakers and create a dynamic, interesting and informative environment.

The seminar cost could be very similar to the marketing conferences currently sponsored by Commerce and Technology. Commerce and Technology staff suggest that a planning budget should be about $15,000 - $20,000 per seminar. This cost assumes that some of the key participants and suppliers would underwrite some of the cost of parts of these seminars or the speaker. Staff to organize would be drawn from the BIC's and C&T.

STAGE 5: EVALUATION

Several participants in this study mentioned that some suppliers would not be able to continue to exist if subjected to a thorough evaluation. This suggests that the overall process should be evaluated and that this evaluation would provide for different measures of performance within the various areas of the science and technology information network and assess effectiveness and efficiency.

Hiring an independent firm to coordinate the evaluation is suggested because many of the

programs and decision-makers who would be involved in this evaluation would also be likely to have somewhat frequent contact with local consultants. While this is not meant to suggest that local firms cannot be objective, it recognizes that objectivity becomes more difficult as contact and familiarity increases.

One is tempted to recommend the use of an out-of-province consulting firm for this evaluation. Many provincial consultants are directly involved with, or dependent upon, members of this network for referrals. This would make the process of independent evaluation more complex.

The cost of this, based on the current evaluation project underway, and the funds allocated for this project, would be between $75 - 100,000.

The evaluation should take place at the end of the third year of this Implementation Plan.

5.0 SUMMARY

The preceding material has provided a summary of the research approach, findings and recommendations concerning the Science and Technology Information Transfer Network Research Project. Additional material is contained in the appendices to this report.

APPENDIX A

HUNTSMAN MARINE SCIENCE CENTRE

Services: Each of Huntsman's core programs provides its own services:

a) Academic. In 1987, nineteen university courses were held. Huntsman's original field station for researchers has evolved into a resident staff who conduct their own research, plus graduate students.

b) Atlantic Reference Centre. This Centre provides an identification service - e.g. what species are at a particular location and in what quantity? This capability is used in various environmental studies. The Centre also deals with fish health at aquaculture cage sites.

c) Aquaculture Program. This technician training program for the aquaculture industry has been running for eleven years.

d) Aquarium. Open to the public.

e) Public Education. Marine sciences information aimed at public schools.

Huntsman does research for the aquaculture industry, mostly applied, but some basic research is also being conducted.

Fees: Service is either free or negotiated if expensive. Centre must maintain a non-profit status.

Mandate: The Centre has a Board of Directors mostly drawn from the university consortium that runs it. Bylaws provide guidance to activities of the centre.

Typical Client: In aquaculture, clients tend to be private companies or consultants. In the training program, students are usually sponsored by government grants.

Most Common Information Request:

This must be considered in various categories. The Centre provides an advisory service to answer such questions as why fish are dying? It also gets practical "how to" questions. Product evaluation is another area of inquiry. Huntsman offers an objective opinion at a lower level of risk.

Communication Network:

Within the province, the Huntsman Marine Science Centre has close ties with the provincial departments of Fisheries and Aquaculture, Natural Resources and Education. It also has close ties with U.N.B. and the University of Moncton, both of whom are member universities of the Huntsman consortium. The centre also has close ties with the fish processing industry, environmental consultants and the media. Links are also maintained with DFO branches in St. Andrews, Halifax and Moncton. Collaborative research, both basic and applied is pursued with the Atlantic Salmon Centre, a neighbour in St. Andrews, and also with the Institute of Oceanography in England.

Outside the province, the egg transfer program is shared with various provincial governments. Problems of water quality are discussed with the NRC and Parks Canada.

Finally, Huntsman deals with various U.S. universities, such as the University of Maine, the Virginia Institute of Marine Science and the University of South Florida.

NATURAL RESOURCES
GEOLOGICAL SURVEYS BRANCH

Services: Geological survey maps, written reports and interpretations of technical data are offered.

Fees: Minimal charges for publications.

Mandate: The Branch operates under the New Brunswick Mining Act.

Typical Client: A wide range of clients, from individuals to large companies.

Most Common Information Request: Aside from publications, the most common request would be technical interpretations of survey data.

Communication Network: Outside the province, the Branch's federal counterpart, the Geological Survey of Canada, is a major source of information via its publications. The Atlantic Provinces Geoscience Society has several meetings a year; the Geological Surveys branches in other provinces have only an annual meeting. These meetings supply technical information and contacts.

Within the province, there is occasional contact with RPC on contract work. U.N.B. does contract work for the Branch, but also looks to the Branch to supply background information on particular problems. Regular contact is maintained with the Department of Municipal Affairs concerning mapping for land use, and the Department of Transportation, who are provided with rock cores as information for sub-surface soil conditions.

PEAT RESEARCH AND DEVELOPMENT CENTRE INC.

Services: There are two main areas of service. The first is to offer a comprehensive analysis of peat for peat producers. This would mainly involve determining the quality of the peat via specific measurable criteria. The second service area is research to develop new peat products.

Fees: Yes, but the Centre is non-profit. Fees are levied only to recover costs.

Mandate: The Centre is incorporated and affiliated with the U de M. It is funded jointly by the province and federal government.

Typical Client: There is a large range of clients; from individuals to large peat producing companies.

Most Common Information Request: Quality analyses of peat, in general.

INNOVATION CENTRE

Services: The basic service of the Centre is to evaluate the potential commercial value of an innovative product. Centre personnel are capable of examining the engineering, marketing and financial aspects of a proposal. Personnel can recommend specific government services or, in the case of prototype development, put the entrepreneur in touch with specialists. The Centre can offer direction, a fair hearing and bring the client to a point where he can make informed decisions.

Fees: No.

Mandate: The Centre is affiliated with the Department of Commerce and Technology. It is funded from the Canada-New Brunswick Subsidiary Agreement on Industrial Innovation and Technology Development.

Typical Client: There are two major categories of clients. One who has a consumer product, the other, a business or technical person with more experience and most likely a better product.

Most Common Information Request: Clients want direction.

Communication Network: While the Innovation Centre gets information and clients from both RPC and CADMI, it also relies on a network of private sector contacts, both new and old, for information.

RESEARCH AND PRODUCTIVITY COUNCIL

Services: The job of RPC is to relate to industry and meet their needs for technical information and support. RPC's services are organized along 8 sectors: Chemical and bio-technical services; electrochemistry; engineering and aquaculture; industry services; mineral development and processing. RPC also has a commitment from the NRC to provide IRAP services in New Brunswick.

Fees: Yes.

Mandate: RPC was established by an Act of the New Brunswick Legislature in 1962.

Typical Client: RPC deals mostly with owner/managers of companies or production supervisors or technical staff.

Most Common Information Request: New product development followed by manufacturing and processing technology and then market planning.

Communication Network: RPC has close ties with the Department of Commerce and Technology, which it supplies with technical information and clients looking for project financing. It also deals with the Innovation Centre, which refers clients, and it co-manages Incutech. RPC has a close, physical link with MTC in the sense that it shares their computer. It also subcontracts microelectronic work to CADMI. Finally, RPC has links with both U.N.B. and the University of Moncton in the sense that they are on its Board of Directors and with the Community Colleges.

CANADIAN FORESTRY SERVICE (MARITIMES)

Services: There are three basic components to CFS activities. The first is research and development, in which CFS works closely with industry through such joint committees as the New Brunswick Forest Research Advisory Committee. While a great deal of research is stimulated by NBFRAC, CFS also conducts basic research into subjects such as acid rain or tree physiology.

The second component of CFS activities is technical services which deals with such specific problems as disease caused by insects.

The third component involves delivery of forest development agreements. This deals with the funding of forest management activities.

Fees: Ordinarily no fees are charged. However, for large industry projects, an attempt would be made to approach the project on a cooperative basis.

Mandate: CFS represents the federal government. Its mandate is rooted in the Forest Development and Research Act of 1968.

Typical Client: Their main clients are large companies, plus a few large landowners. The Province of New Brunswick is a client, as are the woodlot associations. Individuals are also served.

Most Common Information Request: Most general public inquiries concern insects. Industry problems tend to be unique. Most requests would deal with the wide ranging problems of the 'new forest' - the man-made forest - involving site preparation, tree planting and so on.

Communication Network:

Within the province, CFS has ties with U.N.B., which supplies graduate students for various projects, and the University of Moncton at Edmundston, which has a forestry department. Close ties are maintained with such provincial department branches as Timber Management. There is also a frequent link with RPC over contract or collaborative projects. Contacts with the forest products industry are maintained through joint committees like NBFRAC.

Outside the province, CFS maintains links with the six other CFS centers across Canada as well as two CFS institutes. Links are also maintained with Agriculture Canada, within Ottawa and locally at the Experimental Station.

Outside Canada, CFS attends roughly eighteen international conferences annually. It also has contacts with the U.S. Forest Service.

MANUFACTURING TECHNOLOGY CENTRES

Services: There are two major thrusts to the organization; to provide a technical service and to provide training to industry. Additional services include feasibility studies, hardware/software development and some financial services.

Fees: Yes, although charges are levied on a cost recovery basis.

Mandate: The Centre was established in 1983 by the Department of Commerce and Development.

Typical Client: The bulk of clients are involved in MTC training programs. The location of the MTC often dictates the types of clients MTC deals with; for example, the fishing industry is a major client in Moncton. New industries tend to be the ones using technical information.

Most Common Information Request: New product development or improvement.

Communication Network: MTC exchanges information with RPC frequently. It exchanges clients with the Innovation Centre, and clients and information with CADMI. It exchanges information less frequently with DFO and the Huntsman Marine Science Centre in St. Andrews.

THE REGIONAL ECONOMIC DEVELOPMENT COMMISSIONS

Services: The fourteen Commissions publicize federal and provincial funding programs available to local businesses. They assist with applications, and offer referrals to other agencies if necessary. They are also prepared to give limited management advice.

Fees: No.

Mandate: The Commissions are incorporated bodies with bylaws and a Board of Directors and function as independent agencies of the local municipalities.

Typical Client: Anyone with a problem. The Commissions see a range of clients, from individual entrepreneurs to large corporations.

Most Common Information Request: Financial assistance, and information on how to get it.

Communication Network: The Regional Economic Development Commissions maintain links with the federal and provincial funding organizations whose programs they are attempting to publicize to business. This means access to the program data bases at DRIE, the Federal Business Development Bank and Commerce and Technology.

In addition, links are maintained with provincial and federal departments whose programs or policies may have an impact on the local economy.

INCUTECH
(INCUBATION CENTRE)

Services:	Incutech offers subsidized space to those with a technology-related company. Access to labs, technical people, clerical and bookkeeping staff is available. Tenants have access to UNB and RPC services. Arrangements can be made for subsidized space in other cities for those not willing or able to locate in Fredericton. Clients must be doing research and development on a new technology and have a business plan before they are accepted. Once the product is developed they must leave unless they develop another product.
Fees:	The fee is $4.00 per square foot and a 2% equity in the company.
Mandate:	U.N.B. and R.P.C. co-manage the Incubation Centre with funding from the Canada-New Brunswick Subsidiary Agreement on Industrial Innovation and Technology Development.
Typical Client:	Clients tend to be entrepreneurs, or very small companies (1-3 persons).
Most Common Information Request:	Space and clerical support.
Communication Network:	Incutech obtains information from MTC, RPC, U.N.B. and CADMI.

WOOD SCIENCE AND TECHNOLOGY CENTRE

Services: The objective of the Centre is to introduce technological developments into the solid wood products industry. The thrust of its activities is to undertake applied research related to industry needs. There are three areas of research which may benefit softwood lumber producers in the Atlantic Region.

a) research into the relationship between the strength of lumber and the position in the tree stem from which it is cut;

b) the connection between growth features and drying degrade; and

c) finding more economical and error free methods of machine grading lumber into various strength categories.

Fees: Yes, for the most part. The general strategy is to charge sufficient fees for cost recovery, but not to make a profit. Fees would be charged for consulting work, or for standard lab work on a specific project.

Mandate: Limits would be placed by conditions of federal-provincial grants. Within UNB, provided that activities are conducted legally, the Centre has a free hand. It does have an agreement with the Province not to compete with the private sector.

Typical Client: A wide range of clients from small sawmills to the Forest Products Association to consulting engineers. The Centre also undertakes collaborative work with other agencies.

Most Common Information Request: The most common is identification of wood species and is it rotten? Most requests, however, are not of a recurring nature.

Communication Network:

Outside the province, and indeed outside Canada, many contacts are maintained for information on regulations bearing on wood products development. Most of the contacts are two-way, and most are fairly frequent. For example, European standards, Eurocodes, are accessed through various research laboratories in Europe. Standards in the United States are discovered and discussed through contacts at universities such as Colorado State or through specialized institutes like the Forest Products Laboratory at Madison, Wisconsin.

Within Canada, standards are ascertained through the CSA, the National Research Centre and the Alberta Research Council.

Within the province, close ties are maintained with the various departments at U.N.B., including forestry, engineering and economics.

CADMI - UNB

Services: Microelectronics and design of printed circuit boards. It is CADMI's own policy that they hedge from areas in which they are unsure of their knowledge or expertise.

Fees: Yes, but only on a cost-recovery basis.

Mandate: CADMI was established under an initiative by the federal Department of Industry, Trade and Commerce. It is incorporated, with a set of bylaws and a Board of Directors. The Board serves both Fredericton and Moncton offices, and is composed of representatives from provincial government, federal government and industry. CADMI cannot compete with the private sector.

Typical Client: Largest client category have been institutions like UNB and the Department of Agriculture, followed by entrepreneurs.

Most Common Information Request: Printed circuit board design is the most frequent request.

Communication Network: The Fredericton CADMI has close ties with U.N.B. which is both a source of information and clients. It also has a close link with RPC, which it supplies with technical information, but this link is beginning to weaken under the pressure of competition for clients. CADMI has a similarly close tie with MTC, which is not weakening, with whom it exchanges clients and information. The link with the Moncton CADMI is not very strong and consists of occasional information and client referrals.

DEPARTMENT OF FISHERIES AND OCEANS
ST. ANDREWS

Services: Half of the time at DFO St. Andrews is spent estimating the size of the biological resource (fish, molluscs etc.) and providing advice on protection of fish habitat to government. The third area of DFO activities, aquaculture, has two components. The research component tends to work on long term problems. The Demonstration Salmon Farm, however, is designed to assist the novice fish farmer. It concentrates on shorter term applied research and fields the immediate, practical questions. DFO does not function as a consultant.

Fees: No. However, if industry is interested in a research project, DFO will try to divide up the work cooperatively.

Mandate: The Federal Fisheries Act.

Typical Client: In the area of stock size, it is the government and occasionally fish companies. In the area of habitat, it is the same, but primarily government. In the aquaculture field, DFO is involved with the producers, the grower associations.

Most Common Information Request: There is none. The growers, as a group, are more interested in short term, as opposed to long term problems. The larger companies tend to understand the long term implications.

The hatchery operators are asking much more complicated questions. It is not a problem explaining genetics to a hatchery operator, but to a grower it may be much more difficult.

Communication Network: Within the province, DFO St. Andrews maintains contacts with related institutes, such as the Huntsman Marine Science Centre and the Atlantic Salmon

Federation. It also has contact with the provincial Department of Fisheries and Aquaculture. The station also has frequent contact with the fisheries industry in the area.

Outside the province, the station has contact with the other DFO stations across Canada in addition to pertinent fisheries-related organizations in the country.

Finally, individual scientists at the station maintain a network of personal contacts which may stretch across the world.

NATURAL RESOURCES
TIMBER MANAGEMENT BRANCH

Services: The Timber Management Branch has five areas of activity; an insect and disease group, a silvaculture section, operation of tree nurseries, scaling of forest products and forest inventory.

Services to general public would be offered in the areas of insects and disease and the tree nurseries and forest inventory.

Fees: No. Most activities are connected with Crown Land management, so fees would be inappropriate.

There is a fee charged for seedlings to private woodlot owners. The seed extraction plant also has a user fee.

There is a fee to private woodlot owners for insect control. The industry pays by a formula.

Mandate: The Branch is charged with administering several acts; the Crown Lands and Forests Act; the Scalers Act; and the Forest Fires Act.

Typical Client: The Branch deals mainly with organizations, such as forest industry groups or private woodlot owner associations.

Most Common Information Request: There is not a most common request. In the area of insects and disease the main topic is seed and tree pests in plantations. In the area of private woodlots, the board has assisted in the software development of models used for predicting yields depending on various management plans.

Communication Network:

The Timber Management Branch has close ties with the Canadian Forestry Service. It has contact with the Department of Forestry at U.N.B. on a contract basis, and with the NRC, also on a contract basis. It also has occasional links with RPC.

Outside the province, the Branch deals with the Canadian Centre for Remote Sensing.

DEPARTMENT OF FISHERIES AND OCEANS, MONCTON

Services:	Note that DFO is not a service mandated agency. DFO Moncton concentrates its core budget on its mandated activity of resource management. It uses ERDA money and DFO development funds to respond to fishing industry concerns. An example of some of the projects undertaken under ERDA would be the development of mussel aquaculture, growing oysters faster, processing and storing molluscs and ice machines on wharves, among others. DFO plays the role of facilitator by convening joint industry - DFO committees and by sponsoring conferences on matters of interest to industry. Note that DFO's response to industry needs varies depending on the source of funding. Basic research is carried out on some resource areas of interest such as the snow crab, a relatively new industry.
Fees:	No
Mandate:	Federal Fisheries Act.
Typical Client:	There is a full range from the major fishing associations to individual fishermen.
Most Common Information Request:	Financial assistance.

Communication Network:

The responsibilities of DFO, Moncton include the management of all fisheries, both marine and freshwater, in the portion of the Gulf of St. Lawrence that covers PEI and the Gulf Coast areas of Nova Scotia, Newfoundland and New Brunswick. Consequently, DFO Moncton has links with all the provincial government fisheries departments in Atlantic Canada, as well as all the major fishing associations.

Within New Brunswick, in addition to strong links with the provincial Department of Fisheries and Aquaculture, and the array of N.B. fishermen's associations, the Department also has links with DFO, St. Andrews and the specialized marine institutes in the province.

Outside the province, DFO Moncton has ties to all the other DFO stations across the country.

FOOD RESEARCH CENTRE

Services: The overall mandate of the Centre is to provide information, scientific and technical assistance to the food industries of the Maritimes.

-The Centre can offer seminars on food manufacturing technology;

prepare training sessions for industry personnel;

offer advice and assistance to food industries;

evaluate products and processes and conduct analyses of certain food constituents; and

offer services to upgrade food technology in general.

Fees: Yes. Fees are charged on a cost recovery basis. Hourly rates vary from $10 to $35, depending on Centre personnel involved.

Mandate: The Centre is under the authority of the Canadian Institute for Research on Regional Development. The Centre was essentially created to respond to the needs of the food industries of the Maritimes.

Most Common Information Request: There are none. Inquiries and projects run the spectrum of Centre capabilities. The Centre handles simple requests for technical information over the telephone. Where questions arise in areas with which Centre personnel are unfamiliar, they are prepared to familiarize themselves with the subject.

Typical Client: A range of companies, from small to large. Also various associations and commissions.

Communication Network:

Within the province, the Food Research Centre has close ties with chemistry colleagues at the University of Moncton. It also evaluates projects for the NRC and is in the process of establishing a joint partnership on a project with RPC.

Outside the province, the Food Science Centre at St. Hyacinth, P.Q., is in frequent contact for information and training.

DEPARTMENT OF NATURAL RESOURCES
MINERAL DEVELOPMENT BRANCH

Services: There are three areas of service:

a) Regulations - branch personnel point out permits required under Mining Act.

b) Technical Support - available in fields of geology, mining, processing and marketing.

c) Financial - the Branch supplies money for mineral development.

In general, the Branch is interested in the enhancement of mineral development; but, it is also involved at every stage - from exploration to operation, to explaining facility licensing procedures.

Fees: There are no fees, apart from nominal costs of a license. On major projects,the Branch tries to share the cost with collaborators.

Mandate: The Branch is responsible for administering and enforcing the Mining Act of the province. The Federal Mineral Development Act (MDA) is crucial for funding the provision of the services above.

Typical Client: Mining industry clientele of all types are dealt with - from individuals to the largest corporate entities. The Branch also deals with research groups and consultants.

Most Common Information Request: Financial assistance. The next most common is requests for statistical information from various quarters, including government.

Communication Network:

Within the province, the Mineral Development Branch has a close tie with the Department of Municipal Affairs and Environment, since it has an environmental regulatory interest. It also has a close tie with the Department of Commerce and Technology's Working Group on Minerals. Finally, it has ties with labs in the province doing mineral analysis including RPC.

Outside the province, the Branch has a close tie with the CANMET research wing of Energy, Mines and Resources Canada. It also participates in two committees; a federal, provincial Minerals and Statistics Committee and a standing federal-provincial committee on tailings drainage.

DEPARTMENT OF NATURAL RESOURCES
ENERGY BRANCH

Services:

In the area of non-renewable resources, the Branch conducts mapping and geological interpretation over the entire province on the nature of the resource in coal deposits, oil shale and oil and gas deposits. The Branch also has a drilling program for coal over the entire province and can offer advice on such matters as coal mining and oil recovery from oil shale. The Branch also sponsors research into such problems as using the high sulphur/high ash content of the coal found in N.B.

In the area of renewable resources, the Branch is interested in bio-mass projects such as burning wood waste for electricity generation.

With respect to conservation, the Branch conducts Energy Audit Services, which, this year, are concentrating on hotels and motels. The Branch also funds an energy awareness program for public education. Various other energy efficiency projects have also been developed.

Fees:

Minimal fees are charged for maps, licenses and leases.

Mandate:

The Energy Branch administers various provincial acts, namely, the Oil and Natural Gas Act, the Bituminous Act, the Pipeline Act and the Underground Storage Tank Act. The Energy Branch is essentially charged with managing the indigenous energy resources of the province. The Branch must approve claims of mineral rights, exploration and development programs.

Typical Client:

In general, the Branch does not deal with the general public, but with specialists. Most of the clients would come from industry.

In the area of conservation, for example, the typical client is a small to medium-sized business or an institutional client.

In oil and gas, clients are either explorationists or medium to large companies.

Most Common Information Request:

Non-renewables: most frequent questions are on geological information or on the process of acquiring rights. In conservation areas, frequent requests for information are directed to air quality and humidity problems. For bio-mass, questions arise regarding fuel availability.

Communication Network:

The Energy Branch has close ties with its federal counterpart, Energy, Mines and Resources Canada from which it obtains information. It also sits on several committees outside the province: the Coal Research Development Sub-Committee of the Inter-provincial Advisory Committee on Energy, which consists of representatives from industry, the federal government, and producing provinces, and it represents New Brunswick on the Nova Scotia based Committee on Atlantic Coal.

Within the province, the Energy Branch has occasional contact with RPC, as a contract laboratory. It has closer ties with U.N.B. because Branch geologists collaborate with the U.N.B. Geology Department on projects. The Branch also has less frequent contact with the Departments of Mechanical Engineering and Forestry. Finally, the Energy Branch has a close tie with CADMI, with whom it has been working on a solar radiation project for years.

NATIONAL RESEARCH COUNCIL

Services:

The overall mandate of NRC activities in New Brunswick is that no company is to lack for technical information. The NRC offers access to technology specialists for small and medium sized industries.

In general, the NRC is only involved in applied research, not basic. Its intent is to introduce new technology in order to increase both productivity and employment.

The NRC is represented in the Province by twelve Industrial Technology Advisors, under contract to the NRC. The ITA's all have different professional backgrounds in order to offer the broadest possible service.

Technical assistance is essentially only provided to small and medium sized firms employing less than 200 people. The assumption is that firms above 200 employees are capable of helping themselves.

Aside from the size of the firm, another limitation on service is that the NRC is not interested in merely upgrading the technological status of a company, but rather in 'significant improvement where there is a substantial risk'. This substantial risk is defined as commitment to a technological improvement that is of sufficiently large magnitude to cause major problems for the company if it fails.

A final limitation on service delivery is that the NRC does not wish to compete with private sector consultants. The NRC will offer basic information to clients, but will not supply a specialized advisor if a private sector consultant is available.

Most of the NRC's assistance to industry in New Brunswick is carried out under the Industrial Research Assistance Program (IRAP).

Fees: Fees are not charged, but a development project may be done on a cost-sharing basis with a company.

Mandate: The National Research Council is a Crown Corporation with a basic charter to supply technical information.

Typical Client: By definition, it must be a company with less than 200 employees, which usually means one with less than $2 million in sales.

Most Common Information Request: There is none. Twenty to thirty percent of time is spent providing technical information from the published literature. The remainder is face to face consultation.

Communication Network: The NRC in New Brunswick has links, through the NRC in Ottawa, to all the NRC facilities in Canada including laboratories and other technical facilities. In addition, it has access to all specialized centres and institutes in Canada via NRC designated representatives on their staffs. The NRC has access to all the provincial research organizations in Canada. Finally, it has access to all the data bases in Canada and abroad.

Within the province, the NRC has links to such specialized centres as the Huntsman Marine Science Centre and the Manufacturing Technology Centres.

CADMI
UNIVERSITY OF MONCTON

Services: Development of prototypes in the field of microelectronics. This CADMI unit is more oriented to systems work than circuit board design. It does some mechanical engineering and software development and sees itself as an R&D organization, although it is 5% research and 95% development.

Fees: Yes. Either by day or hour or on a contract basis. They are non-profit trying to recover costs.

Mandate: CADMI was established under an initiative by the federal Department of Industry, Trade and Commerce. It is incorporated with a set of bylaws, and a Board of Directors. The Board serves both Fredericton and Moncton CADMI offices and is composed of provincial government, federal government and industry representatives.

Typical Client: It is evenly divided between companies and inventors. Clients also are drawn from the fishing industry, pulp and paper industry and the optical industry.

Most Common Information Request: The most common request would revolve around process control (controlling machines). The next most common would be data acquisitions - that is, getting data from the shop floor electronically.

Communication Network: The Moncton CADMI has close links with the Moncton MTC, which is just across the hall. It has less frequent contacts with its sister CADMI in Fredericton and with RPC.

Outside the province it has strong links with microchip suppliers who supply information on specific problems.

N.B. DEPARTMENT OF AGRICULTURE
AGRICULTURAL ENGINEERING BRANCH

Services:

The Agricultural Engineering Branch, through regional engineers, provides services to farmers on design of farm structures, farm equipment via a machinery specialist and advice on soil and water problems.

The Branch also participates in the Technological Advisory Committee which is a federal - provincial committee funded under the Agricultural Food Agreement. This Committee will substantially fund projects involving the research and development of agriculture related technologies, the demonstration of agricultural technology that is essentially unknown in the province, or the acceleration of a technology that has potentially substantial benefit to NB farmers if better known.

Fees:

No fees for advice. Minimal fees for plans.

Mandate:

The mandate is rooted in the general functions of the provincial Department of Agriculture.

The Agricultural Engineering Branch is a sub-unit of the Agricultural Resource Development Branch. Its mandate is defined in the publication Goals, Objectives and Organization for the New Brunswick Department of Agriculture (February, 1988)

Typical Client:

Clients are drawn either from small companies, producing farmers, or the general public.

Most Common Information Request:

For structures, it is design. The farm equipment technicians are kept very busy - they also give courses in combine adjustment and potato bruise control.

Communication Network:

One of the principal sources of information for this Branch is a dispersed network of specialists spread across every province in Canada and in many states in the United States.

Outside the province, more formal links are maintained with the Canada Plan Service - one of the most successful federal-provincial services in agricultural engineering.

Ties are maintained with Agriculture Canada concerning machinery. Membership in the Atlantic Committee on Agriculture Engineering yields technical seminars and presentation of papers. Similarly, membership in both the Canadian and the American Society of Agricultural Engineers yields exposure to technical discussions.

Within the province, the Agricultural Engineering Branch deals with RPC occasionally on specific projects. RPC also sits on the Technology Advisory Committee. Finally, the Branch has contacts at Guelph and the University of Moncton at Shippigan for specific projects.

SCIENCE LIBRARY
UNIVERSITY OF NEW BRUNSWICK
FREDERICTON

Services: The most fundamental service offered to the public is access to the collection. That is followed by reference access, on-line data base searches, inter-library loan, a science/technology index of New Brunswick publications, a software library on information management and knowledge of sources.

Fees: No fee for access to the collection, but there is a charge for on-line data base searches.

Mandate: No policies mandate services except the general university mandate and the tradition of public access to information.

Typical Client: The most typical client would probably be a consultant, followed by companies large and small, alumni, entrepreneurs, some provincial government departments and assistance to the special libraries in the region.

Most Common Information Request: Use of the collection followed by on-line searches.

Communication Network: The science library at U.N.B. in Fredericton is the single largest collection of scientific literature in New Brunswick. As such, it is at the centre of a network of users external to the University.

Special libraries such as those at RPC, CFS, the Legislature, the Chalmers Hospital and the Department of Fisheries and Oceans in St. Andrews have been steady users of the facilities for years. It did RPC data base searches for a long time, and, in fact, helped

set up the RPC library. It might be noted that the public access to the science library is not matched by many of the special libraries which have restricted access to their collections. The science library also assists the specialized libraries by training their personnel in new techniques of information acquisition.

It also responds to requests from the New Brunswick Public Library system, especially the Fredericton branch.

In addition, the library serves some provincial government departments such as Natural Resources, which has recently acquired its own database search capability, Environment and Health.

The library also responds to the needs of business. It does data base searches for McCain Foods, for example, since the library at Agriculture Canada, which might be a more logical choice, has a policy of restricted access to the public. The library also serves other major businesses in the province.

Finally, through the inter-library loan system, the science library does business with the rest of the country.

Department of Commerce and Technology

Services: Commerce and Technology offers marketing programs and development, technical, financial and management assistance, training seminars and general information or referral services.

Fees: There are no fees for services rendered. However, some financial assistance programs involve cost sharing with the client.

Mandate: Commerce and Technology is responsible for developing the manufacturing and processing sectors of the New Brunswick economy.

Typical Client: Clients tend to be from small to mid-sized businesses and represent a wide cross-section of industries.

Most Common Information Request: Financial assistance is the most common request. This request for money often accompanies a request for technical, marketing or management assistance.

Communication Network: The Department of Commerce and Technology is in regular contact with many of the members of the information network. The information exchange with RPC and the Innovation Centre is frequent and includes client referrals. This is also the case with the Department of Natural Resources and the Department of Agriculture. The contact with the NRC is frequent but is often in association with the RPC. Commerce and Technolgy has a close link with MTC which it supplies with information and cliet referrals. The information exchange with DIST is less frequent and tends to be a one-way flow.

APPENDIX B

PERSONAL INTERVIEWS - SCIENCE & TECHNOLOGY

Outline Introduction:

1. Could you briefly summarize the services provided by this organization.

1A Do you charge fees?

1B Do any policies limit or specifically define the services you provide?

1C Can your organization meet the demand that exists? - IF NOT - How do you decide who to turn away?

2. What types of people or organizations are most likely to use these services?

3. How do your customers learn about these services?

4. When they come here, how informed are they? What expectations do they have when they walk in the door?

5. What do customers ask you to supply, what is the most common request?

6. Thinking about the needs of customers - from your perspective, what gaps exist, what are client needs in relation to science and technology that are not yet available or are difficult to access?

7. Thinking about the services you provide, how would you rate your agency on service delivery? What are your strengths and weaknesses?

8. Now, because a part of our task involves a determination of who talks to whom - what communications network is in place? I'd like to have you tell me the organizations with which you share information related to science and technology on a regular basis. We'll fill in this basic chart.

8A Is that on-going or sporadic information sharing?

8B From your perspective, how would you rate the overall communication of science and technology information in N.B.?

8C Does this sharing of information relate to clients - do they benefit from an increased awareness?

8D What is your major source of information?

9. As a key participant, what would you change about the science and technology information sharing currently in place?

ALSO:

Ask each: Who/what are the most technologically advanced firms in this province?

APPENDIX C

LIST OF INNOVATIVE FIRMS

New York Boiler
Brunswick Mining
Consolidated Bathurst
Irving
Fraser
Atlantic Wafer Board
Sea Farms Canada
McCain's
Dairytown
Atlantic Co-op
Digital Products
Allmark
Season Supplies
Barbour Foods
Bourque Industrial
Imperial Signs
Can Ray
NB Tel
Westmorland Labs
NCA MicroElectronics
Connors Bros.
Ocean Optical
Canada Packers
Mills Seafood
Westmorland Fisheries
Juniper Lumber
New Brunswick International Paper
Craig's Machine Shop
Universal Systems
Miramichi Pulp and Paper

APPENDIX D

RESP £ (1-3)___ ___ ___

SIC CODE (4-7) ___ ___ ___ ___

In this survey we want to collect information which will help us understand how businesses in New Brunswick get information related to science and technology. We also would like to know how, if at all, you come into contact with government services.

Before we start this survey I do want to let you know that all your answers are confidential. Our results will be presented in summary form and we will not mention any one firm in our report. We hope that you will think about each question and answer each one as honestly as possible. If you don't want to answer a question, just say so and I will move on to the next one.

We want to begin with a few questions about your business...so we can understand how patterns differ within different groups of businesses.

Q.1 First of all, in what year was your business started, regardless of the incorporation date - when did this company begin operations?

ENTER YEAR .....(8-9) ___ ___

D.K.....97

REF/N.A.....98

Q.2 Does this company produce a product, supply a service or what?

SERVICE.....(10).....1

PRODUCT.....2

BOTH.....3

REF.D.K./N.A.....9

Q.2A Can you briefly describe your business what is produced or supplied? (PROBE FOR DETAILS)

_____

_____

USE FOR SIC CODE IDENTIFICATION - ENTER CODE ABOVE

Q.3 Altogether, how many people, including yourself, are employed by this company? ENTER NUMBER:ENTER 995 FOR MORE THAN 950 BUT WRITE EXACT NUMBER ON LEFT

NUMBER.....(11-13) ___ ___ ___

D.K.....997

REF/N.A.....998

Now, we want to turn to a few questions about your sources of information for your business.

Q.4 Do you subscribe to any trade journals or business magazines which you consider to be an important source of information related to the application of science and technology...IF YES : could you tell me the ones which are most important to you...ENTER FIRST THREE MENTIONS:

		CODE	DK	REF/NA	NOT APP.
FIRST_____	(14-15)	___ ___	77	98	00
SECOND _____	(16-17)	___ ___	77	98	00
THIRD _____	(18-19)	___ ___	77	98	00

Q.5 Do sales and service reps. play a role in keeping you up to date on technological change applicable to your business? IF YES ASK: How important a source of information are sales or service reps:

very important.....(20)...1

somewhat important.....2

not very important.....3

no role.....5 SKIP TO Q.6

Q.5A Is there any particular manufacturer or supplier for your industry/business that you would consider an excellent source for information related to science and technology? IF YES PROBE FOR CLARITY AND ENTER AND PROBE FOR ANY OTHER MENTIONS: are there any others?

		CODE	DK	REF/NA	NOT APP.
FIRST_____	(21-2)	___ ___	77	98	00
SECOND _____	(23-4)	___ ___	77	98	00
THIRD _____	(25-6)	___ ___	77	98	00

Q.6 In your business, what would you say is your major source for updated information related to technological change or innovation...(READ ALL CHOICES)

other people in the business community..(27-8).....11

trade publications or journals.....12

suppliers or manufacturers.....13

government agencies.....14

universities.....15

conferences or seminars.....16

A COMBINATION OF SOURCES (CLARIFY)

_____.....___ ___

D.K.....97

REF/N.A.....98

Q.7 Is your business currently engaged in research and development activities:

YES.....(29)....1

NO.....2 SKIP TO Q.7-1

D.K./REF.....9

Q.7A In what general area is your R & D activity concentrated?

_____

_____ (30-32) __ __ __

D.K./REF.....997

Q.7B Approximately what percent of your total operating budget is allocated to R & D?

ENTER PERCENT (33-34).___ ___

DK.....97

REF.....98

Q.7C Are there many, some or just a few other firms in this province working in this area of R & D?

MANY.....(35).....1

SOME.....2

JUST A FEW.....3

NONE.....0

D.K.....7

Q.7-1 In general, would you say that you are in contact regularly...occasionally...or not at all with some of the firms which are conducting R & D activities which could have an effect on your business?

REGULARLY.....(36)...1

OCCASIONALLY.....2

NOT AT ALL.....5

D.K.....3

REFUSED/N.A.....4

Q.8 From a personal perspective, how important is access to scientific and technological information...

very important.....(37)..1

somewhat important.....2

not very important.....3

not at all important.....4

D.K.....7

REF/N.A.....8

Q.9 How would you rate your company in terms of access to updated information...is your company...READ ALL OPTIONS EXCEPT D.K.

up to date on most of the latest information.....(38)...1

somewhat up to date, but not on top of everything.....2

not very up to date on things that could affect you.....3

not at all up to date.....4

D.K./REF.....7

Q.10 Thinking about your business, what type of <u>information</u> related to science or technological change would be of the most help to you in becoming more innovative or just keeping up?

_____

_____(39-40)___ ___

D.K.....97

REFUSED.....98

Q.11 One of our tasks in this research effort will involve the development of a system for helping businesses to have improved access to updated information about science and technology - we'd like your help with this task. First of all, who do you think is most able to provide <u>useful</u> business information - the federal government, the provincial government, universities, government funded independent agencies or the private sector.

FEDERAL GOVERNMENT.....(41).....1

PROVINCIAL GOVERNMENT.....2

UNIVERSITIES.....3

GOVT-FUNDED AGENCIES.....4

PRIVATE SECTOR.....5

COMBINATION (WHICH_____

_____...6

Q.12 Who do you think is most able to deliver useful scientific and technological information - the federal government, the provincial government, universities, government funded independent agencies or the private sector.

FEDERAL GOVERNMENT..... (42).....1

PROVINCIAL GOVERNMENT.....2

UNIVERSITIES.....3

GOVT-FUNDED AGENCIES.....4

PRIVATE SECTOR.....5

COMBINATION (WHICH_____

_____...6

Q.13A Thinking about your business, is there any particular type of program or service which would help you to do a better job of becoming more innovative or better able to adjust to changing technologies? IF YES: could you describe that for me?

_____

_____

_____(43-44) ___ ___

NO SUGGESTIONS.....95

D.K./REF.....97

Q.13B Thinking about your experiences in business, can you think of any way in which it could be made easier for businesses to gain access to up-to-date scientific or technological information...what could be done to give you better access to up to date information?

_____

_____

_____(45-46)___ ___

DK/REF.....97

Q.14 We want to know how familiar the business community is with some of the programs and services involved with science and technology available in this province: REPEAT POINT are you familiar with the services available through (READ EACH SERVICE) or is this the first you've heard of this department/agency IF FAMILIAR: are you very, somewhat or not very familiar with this department? (START WITH FIRM MARKED BY 'X')

			VERY FAM.	SOME FAM.	NOT FAM.	FIRST HEARD	DK REF
14A	The Department of Commerce and Technology	(47)	1	2	3	4	7
14B	The RPC - Research and Productivity Council	(48)	1	2	3	4	7
14C	DRIE - the Department of Regional/Industrial Expansion	(49)	1	2	3	4	7
14D	ACOA - the Atlantic Canada Opportunities Program	(50)	1	2	3	4	7
14E	MTC - the Manufacturing Technology Centres in the province	(51)	1	2	3	4	7
14F	The Innovation Center located in Fredericton	(52)	1	2	3	4	7
14G	The Incubation Center located at U.N.B.	(53)	1	2	3	4	7
14H	NRC - the National Research Council	(54)	1	2	3	4	7
14I	The CMA - Canadian Manufacturers Association	(55)	1	2	3	4	7
14J	UNB's CADMI	(56)	1	2	3	4	7
14K	U de M's CADMI	(57)	1	2	3	4	7
14L	The Industrial Development Commissions	(58)	1	2	3	4	7

Q.15 In the past two years (REPEAT POINT AFTER 5 MENTIONS) have you received any information or assistance related to scientific research or technological change from any of the following firms or suppliers (READ ONLY THOSE WITH WHICH THE RESPONDENT IS FAMILIAR)

			YES	NO	REF/DK	NOT APPR
15A	The Department of Commerce and Technology	(59)	1	2	7	0
15B	The RPC - Research and Productivity Council	(60)	1	2	7	0
15C	DRIE - the Department of Regional/Industrial Expansion	(61)	1	2	7	0
15D	ACOA - the Atlantic Canada Opportunities Program	(62)	1	2	7	0
15E	MTC - the Manufacturing Technology Centres in the province	(63)	1	2	7	0
15F	The Innovation Center located in Fredericton	(64)	1	2	7	0
15G	The Incubation Center located at U.N.B.	(65)	1	2	7	0
15H	NRC - the National Research Council	(66)	1	2	7	0
15I	The CMA - Canadian Manufacturers Association	(67)	1	2	7	0
15J	UNB's CADMI	(68)	1	2	7	0
15K	U de M's CADMI	(69)	1	2	7	0
15L	The Industrial Development Commissions	(70)	1	2	7	0

Q.16 FOR THOSE FIRMS CONTACTED: How did your firm first learn about or come in contact with.... (READ APPROPRIATE FIRM) and what did you initially want from them?

CARD 2
RESP (1-3) ___ ___ ___

16A The Department of Commerce and Technology_____

_____(4-5) ___ ___

(6-7) ___ ___

16B The RPC - Research and Productivity Council_____

_____(8-9) ___ ___

(10-11) ___ ___

16C DRIE - the Department of Regional/Industrial Expansion_____

_____(12-13) ___ ___

(14-15) ___ ___

16D ACOA - the Atlantic Canada Opportunities Program_____

_____(16-17) ___ ___

(18-19) ___ ___

16E MTC - the Manufacturing Technology Centres in the province_____

_____(20-21) ___ ___

(22-23) ___ ___

16F The Innovation Center located in Fredericton_____

_____(24-25) ___ ___

(26-27) ___ ___

16G The Incubation Center located at U.N.B._____

_____(28-29) ___ ___

(30-31) ___ ___

16H NRC - the National Research Council _____ (32-33) __ __

(34-35) __ __

16I The CMA - Canadian Manufacturers Association _____ (36-37) __ __

(38-39) __ __

16J UNB's CADMI _____ (40-41) __ __

(42-43) __ __

16K U de M's CADMI _____ (44-45) __ __

(46-47) __ __

6L The Industrial Development Commissions _____ (48-49) __ __

(50-51) __ __

Q.17 In general, how would you rate the quality of service you received from (READ APPROPRIATE FIRMS)...was it excellent...good...only fair or poor?

			EXCEL	GOOD	ONLY FAIR	POOR	NOT APPR	DK/REF
17A	The Department of Commerce and Technology	(52)	1	2	3	4	0	7
17B	The RPC - Research and Productivity Council	(53)	1	2	3	4	0	7
17C	DRIE - the Department of Regional/Industrial Expansion	(54)	1	2	3	4	0	7
17D	ACOA - the Atlantic Canada Opportunities Program	(55)	1	2	3	4	0	7
17E	MTC - the Manufacturing Technology Centres in the province	(56)	1	2	3	4	0	7
17F	The Innovation Center located in Fredericton	(57)	1	2	3	4	0	7
17G	The Incubation Center located at U.N.B.	(58)	1	2	3	4	0	7
17H	NRC - the National Research Council	(59)	1	2	3	4	0	7
17I	The CMA - Canadian Manufacturers Association	(60)	1	2	3	4	0	7
17J	UNB's CADMI	(61)	1	2	3	4	0	7
17K	U de M's CADMI	(62)	1	2	3	4	0	7
17L	The Industrial Development Commissions	(63)	1	2	3	4	0	7

Q.18 FOR THOSE FIRMS CONTACTED: Is there any particular change or suggestion you would make to (READ APPROPRIATE FIRM) in order to improve the quality of the service you received or to better respond to business needs?

CARD 3
RESP (1-3) ___ ___ ___

18A The Department of Commerce and Technology_____

_____(4-5) ___

(6-7) ___

18B The RPC - Research and Productivity Council_____

_____(8-9) ___

(10-11) ___

18C DRIE - the Department of Regional/Industrial Expansion_____

_____(12-13) ___

(14-15) ___

18D ACOA - the Atlantic Canada Opportunities Program_____

_____(16-17) ___

(18-19) ___

18E MTC - the Manufacturing Technology Centres in the province_____

_____(20-21) ___

(22-23) ___

18F The Innovation Center located in Fredericton_____

_____(24-25) ___

(26-27) ___

18G The Incubation Center located at U.N.B._____

_____(28-29) ___

(30-31) ___

18H NRC - the National Research Council

(32-33) __ __

(34-35) __ __

18I The CMA - Canadian Manufacturers Association

(36-37) __ __

(38-39) __ __

18J UNB's CADMI

(40-41) __ __

(42-43) __ __

18K U de M's CADMI

(44-45) __ __

(46-47) __ __

18L The Industrial Development Commissions

(48-49) __ __

(50-51) __ __

Q.19 Thinking about these departments, agencies or businesses...does any one seem most capable of answering the types of questions that you might have concerning scientific research or technological change? IF YES ASK WHICH ONE AND WHY?

ENTER SUPPLIER_____(52-53)___ ___

WHY_____

_____(54-55)___ ___

Q.20 If there were a telephone number or a place which you could visit - sort of a one stop shopping place for scientific or technological information for business - do you think that you would be very likely...somewhat likely...not very likely...or not at all likely to use this service?

VERY LIKELY.....(56).....1

SOMEWHAT LIKELY.....2

NOT VERY LIKELY.....3

NOT AT ALL LIKELY.....4

D.K.....7

REF/N.A.....8

Q.21 ENTER THE NUMBER OF CONTACTS TO REACH THIS BUSINESS (57)... ___

Q.22 ENTER THE LENGTH OF INTERVIEW.....(58-59)..___ ___

That's all the questions that we have for you today...thanks for your help.

RESP £ (1-3)___ ___ ___

SIC CODE (4-7) ___ ___ ___ ___

Par ce sondage nous voulons amasser les informations qui nous permetteront de comprendre comment les compagnies au Nouveau-Brunswick se procurent les informations relatives à la science et à la technologie. Nous aimerions savoir également si oui ou non vous êtes en communication avec les services gouvernementaux.

Avant de commencer ce sondage, j'aimerais que vous sachiez que toutes vos réponses sont strictement confidentielles. Nos résultats seront remis d'une façon résumée et aucune compagnie ou nom de personne ne seront mentionné dans notre rapport. Nous esperons que vous analyserez chaque question et répondrez à chacune le plus honnêtement possible. S'il y a une question à laquelle vous ne désirez pas répondre, dites-le moi et nous passerons à la question suivante.

Nous aimerions commencer en vous posant quelques questions au sujet de votre compagnie...pour essayer de comprendre comment le mode d'opération diffère à l'intérieur des différents groupes de compagnies.

Q.1 Premièrement, en quelle année votre compagnie a-t-elle été mise sur pied, sans tenir compte de la date d'incorporation - quand votre compagnie a-t'elle entrée en opération?

ENTER YEAR .....(8-9) ___ ___

NSP.....97

REF/N.A.....98

Q.2 Est-ce une compagnie qui fabrique un produit, qui offre des services ou quoi?

SERVICES.....(10).....1

PRODUIT.....2

LES DEUX.....3

REF/NSP/N.A.....9

Q.2A Pouvez-vous brièvement nous décrire ce que fabrique ou offre votre compagnie? (SONDEZ POUR PLUS DE DETAILS)

_____

_____

_____

UTILISEZ CODE SIC POUR IDENTIFICATION - INSCRIRE CODE AU-DESSUS

Q.3 Au total, et vous incluant, combien de personnes sont-elles à l'emploi dans votre compagnie? INSCRIVEZ NUMERO: INSCRIVEZ 995 POUR PLUS QUE 950 MAIS INSCRIVEZ LE NUMERO EXACT A LA GAUCHE.

NUMERO.....(11-13) ___ ___ ___

N.S.P.....997

REF/N.A.....998

Maintenant nous aimerions vous poser quelques questions au sujet de vos sources d'information pour votre compagnie.

Q.4 Etes-vous abonné à des périodiques ou magazines d'affaires que vous considérez comme étant une source importante d'information reliée directement à l'application de la science et de la technologie...SI OUI: Pouvez-vous me nommer ceux qui sont les plus importants pour vous...INSCRIVEZ LES TROIS PREMIERS MENTIONNES:

		CODE	NSP	REF/NA	NOT APP.
PREMIER_____	(14-15)	___ ___	77	98	00
DEUXIEME_____	(16-17)	___ ___	77	98	00
TROISIEME_____	(18-19)	___ ___	77	98	00

Q.5 Est-ce que les vendeurs et les hommes de service vous tiennent au courant des derniers changements ou améliorations techniques applicables à votre compagnie? SI OUI DEMANDEZ: Quelle importance portez-vous à ces vendeurs et ces hommes de service comme source d'information:

très important.....(20)...1

plus ou moins important.....2

pas très important.....3

pas du tout important.....5 SKIP TO Q.6

Q.5A Y a-t-il un manufacturier ou un fournisseur en particulier relié à votre industrie ou compagnie que vous considérez comme étant une excellente source d'information en matière de science et de technologie? SI OUI SONDEZ POUR OBETENIR DES PRECISIONS ET INSCRIVEZ ET SONDEZ POUR D'AUTRES MENTIONS: Y en a-t-il d'autres?

		CODE	NSP	REF/NA	NON APP.
PREMIER_____	(21-2)	___ ___	77	98	00
DEUXIEME_____	(23-4)	___ ___	77	98	00
TROISIEME_____	(25-6)	___ ___	77	98	00

Q.6 Dans votre domaine, quelle serait votre principale source d'information à jour en matière de changements ou d'innovations technologiques... (LISEZ TOUS LES CHOIX)

d'autres personnes dans le monde

des affaires.....(27-8).....11

des périodiques et des publications.....12

fournisseurs et manufacturiers.....13

agences gouvernementales.....14

universités.....15

conférences ou colloques.....16

UNE COMBINAISON DE PLUSIEURS SOURCES

(PRECISEZ)

_____.....___ ___

NSP.....97

REF/N.A.....98

Q.7 Est-ce que votre compagnie participe présentement à des activités de recherche et de développement:

OUI.....(29)....1

NON.....2

NSP/REF.....9

SKIP TO Q.7-1

Q.7A Dans quelle direction sont concentrées vos activités de R&D?

_____

_____ (30-32) __ ___ ___

NSP/REF.....997

Q.7B Quel est le pourcentage approximatif de votre budget total qui est alloué à la recherche et au développement?

ENTER PERCENT (33-34).___ ___

NSP.....97

REF.....98

Q.7C Dans cette province, y a-t-il beaucoup, un certain nombre, ou seulement quelques compagnies qui travaillent dans ce domaine de R&D?

BEAUCOUP.....(35).....1

UN CERTAIN NOMBRE.....2

SEULEMENT QUELQUES.....3

AUCUNE.....0

NSP.....7

Q.7-1 En général, diriez-vous que vous êtes en contact régulier...de temps en temps...ou pas de tout avec certaines des compagnies qui travaillent à la recherche et au développement qui pourraient avoir un effet sur votre compagnie?

REGULIER.....(36)...1

DE TEMPS EN TEMPS.....2

PAS DE TOUT.....5

NSP.....3

REF/N.A.....4

Q.8 En ce qui vous concerne personnellement, est-ce qu'il vous est important d'avoir accès aux informations scientifiques et technologique?

très important.....(37)..1

plus ou moins important.....2

pas très important.....3

aucune importance.....4

D.K.....7

REF/N.A.....8

Q.9 Comment classeriez-vous votre compagnie en termes d'accès aux informations à jour...est-ce que votre compagnie est (LISEZ TOUTES LES OPTIONS SAUF NSP)

à jour sur la plupart des dernières informations.....(38)...1

plus ou moins à jour mais pas à la fine pointe de l'actualité.....2

pas tout à fait à jour sur ce qui pourrait vous affecter.....3

pas du tout à jour.....4

NSP/REF.....7

Q.10 En pensant à votre compagnie, quel genre d'informations reliées aux changements de la science ou de la technologie vous serait le plus utile au niveau d'innovations ou simplement pour vous maintenir à jour?

_____

_____(39-40)___ ___

NSP.....97

REF.....98

Q.11 Une de nos tâches dans cette étude impliquera le développement d'un système qui aidera les compagnies à avoir meilleur accès à l'information à jour sur la science et la technologie - nous aimerions votre aide pour cette tâche. Premièrement, qui selon vous est le plus en mesure de fournir des informations d'affaires utiles - le gouvernement fédéral, le gouvernement provincial, les universités, les agences indépendantes subventionnées par le gouvernement ou le secteur privé.

LE GOUVERNEMENT FEDERAL.....(41).....1

LE GOUVERNEMENT PROVINCIAL.....2

LES UNIVERSITES.....3

LES AGENCES SUBVENTIONNEES PAR LE GOUV.....4

LE SECTEUR PRIVE.....5

COMBINAISON (LESQUELLES_____

_____...6

Q.12 Qui pensez-vous est le plus en mesure de fournir des informations scientifiques et technologiques utiles - le gouvernement fédéral, le gouvernement provincial, les universités, les agences indépendantes subventionnées par le gouvernement ou le secteur privé.

LE GOUVERNEMENT FEDERAL.....(41).....1

LE GOUVERNEMENT PROVINCIAL.....2

LES UNIVERSITES.....3

LES AGENCES SUBVENTIONNEES PAR LE GOUV.....4

LE SECTEUR PRIVE.....5

COMBINAISON (LESQUELLES_____

_____...6

Q.13A En pensant à votre compagnie, y a-t-il en particulier un genre de programme ou un service qui pourrait-vous aider à devenir plus innovateur ou à être en mesure de faire les ajustements nécessaires selon les changements technologiques? SI OUI: Pouvez-vous élaborer?

_____

_____

_____(43-44) ___ ___

AUCUNE SUGGESTION.....95

D.K./REF.....97

Q.13B En tenant compte de vos expériences en affaires, que pensez-vous pourrait permettre aux compagnies d'avoir un accès plus facile aux informations scientifiques et technologiques à jour...que pourrions-nous faire pour vous donner une meilleure accessibilité aux informations à jour?

_____

_____

_____(45-46)___ ___

NSP/REF.....97

Q.14 Nous aimerions savoir jusqu'à quel point le monde des affaires se familiarise avec quelques programmes et services impliqués avec la science et la technologie disponibles dans cette province: REPETEZ LE POINT Etes-vous familier avec les services disponibles chez (LISEZ CHACUN DES SERVICES) ou est-ce la première fois que vous entendez parler de ce ministère/organisme SI FAMILIER: Etes-vous très...plus ou moins ou pas très familier avec ce ministère? (COMMENCEZ PAR LA COMPAGNIE MARQUEE D'UN 'X')

			VERY FAM.	SOME FAM.	NOT FAM.	FIRST HEARD	DK REF
14A	Ministère du Commerce et de la Technologie	(47)	1	2	3	4	7
14B	Conseil de la recherche et de la productivité (CRP)	(48)	1	2	3	4	7
14C	ministère de L'Expansion industrielle régionale (MEIR)	(49)	1	2	3	4	7
14D	APECA - l'Agence de Promotion Economique du Canada Atlantique	(50)	1	2	3	4	7
14E	Centres de technologie manufacturière (CTM) dans la province	(51)	1	2	3	4	7
14F	Centre d'innovation N-B à Fredericton	(52)	1	2	3	4	7
14G	Le Centre d'incubation à U.N.B.	(53)	1	2	3	4	7
14H	Conseil national de recherches (CNRC)	(54)	1	2	3	4	7
14I	L'Association des manufacturiers canadiens	(55)	1	2	3	4	7
14J	CADMI à UNB	(56)	1	2	3	4	7
14K	CADMI à U de M	(57)	1	2	3	4	7
14L	Commissions pour le developement industriel	(58)	1	2	3	4	7

Q.15 Pendant les deux dernières années avez-vous reçu de l' information ou de l'aide reliée à la recherche scientifique ou aux changements technologiques de la part des compagnies ou des fournisseurs suivants (LISEZ SEULEMENT LE NOM DES ORGANISMES AVEC LESQUELS VOTRE INTERLOCUTEUR EST FAMILIER)

			OUI	NON	REF/NSP	NON APPR
15A	Le Ministère du Commerce et de la Technologie	(47)	1	2	7	0
15B	Le Conseil de la recherche et de la productivité (CRP)	(48)	1	2	7	0
15C	Le ministère de L'Expansion industrielle régionale (MEIR)	(49)	1	2	7	0
15D	L'APECA - L'Agence de Promotion Economique du Canada Atlantique	(50)	1	2	7	0
15E	Les Centres de technologie manufacturière (CTM) dans la province	(51)	1	2	7	0
15F	Le Centre d'innovation N-B à Fredericton	(52)	1	2	7	0
15G	Le Centre d'Incubation à U.N.B.	(53)	1	2	7	0
15H	Le Conseil national de recherches (CNRC)	(54)	1	2	7	0
15I	L'Association des manufacturiers canadiens	(55)	1	2	7	0
15J	CADMI à UNB	(56)	1	2	7	0
15K	CADMI à U de M	(57)	1	2	7	0
15L	Les Commissions pour le developement industriel	(58)	1	2	7	0

Q.16 POUR LES COMPAGNIES QUI ONT ETE CONTACTEES: Comment votre compagnie a-t-elle appris l'existence de...(LISEZ LE NOM DE LA COMPAGNIE APPROPRIEE) et que vouliez-vous au début?

CARD 2
RESP (1-3) ___ ___ ___

16A ministère du Commerce et de la Technologie_____

_____(4-5) ___ ___

(6-7) ___ ___

16B Conseil de la recherche et de la productivité_____

_____(8-9) ___ ___

(10-11) ___ ___

16C ministère de l'Expansion industrielle régionale (MEIR)_____

_____(12-13) ___ ___

(14-15) ___ ___

16D APECA - Agence de Promotion Economique du Canada Atlantique_____

_____(16-17) ___ ___

(18-19) ___ ___

16E Centre de technologie manufacturière in the province_____

_____(20-21) ___ ___

(22-23) ___ ___

16F Centre d'innovation N-B à Fredericton _____

_____(24-25) ___ ___

(26-27) ___ ___

16G le Centre d'Incubation localisé à U.N.B._____

_____(28-29) ___ ___

(30-31) ___ ___

16H Conseil national de recherches (CNRC) _____ (32-33) __

(34-35) __

16I L'Association des manufacturiers canadiens _____ (36-37) __

(38-39) __

16J CADMI à UNB _____ (40-41) __

(42-43) __

16K CADMI à U de M _____ (44-45) __

(46-47) __

16L Commissions pour le developement industriel _____ (48-49) __

(50-51) __

Q.17 En général, comment qualifieriez-vous la qualité du service reçu de (LISEZ LES COMPAGNIES APPROPRIEES) etait-il excellent...bon...passable ou pauvre?

			EXCEL	BON	PASS-ABLE	PAU-VRE	NON APPR	NSP/RE
17A	ministère dy Commerce et de la Technologie	(52)	1	2	3	4	0	7
17B	Conseil de la recherche et de la productivité	(53)	1	2	3	4	0	7
17C	ministère de l'Expansion industrielle règionale	(54)	1	2	3	4	0	7
17D	APECA - Agence de promotion du canada atlantique	(55)	1	2	3	4	0	7
17E	Centre de technologie manufacturière dans la province	(56)	1	2	3	4	0	7
17F	Centre d'innovation N-B à Fredericton	(57)	1	2	3	4	0	7
17G	Le Centre d'Incubation à U.N.B.	(58)	1	2	3	4	0	7
17H	Conseil national de recherches	(59)	1	2	3	4	0	7
17I	L'Association des manufacturiers canadiens	(60)	1	2	3	4	0	7
17J	CADMI à UNB	(61)	1	2	3	4	0	7
17K	CADMI à U de M	(62)	1	2	3	4	0	7
17L	Commissions pour le developement industriel	(63)	1	2	3	4	0	7

Q.18 POUR LES COMPAGNIES CONTACTEES: Y a-t-il un changement en particulier ou une suggestion que vous feriez au (LISEZ LE NOM DES COMPAGNIES APPROPRIEES) pour améliorer la qualité du service reçu d'eux pour mieux servir les besoins des compagnies?

CARD 3
RESP (1-3) ___ ___ _

18A ministère du Commerce et de la Technologie_____

_____(4-5) _ ___ _

(6-7) ___ _

18B Conseil de la recherche et de la productivité_____

_____(8-9) ___ _

(10-11) ___ _

18C ministère de l'Expansion industrielle régionale (MEIR)_____

_____(12-13) ___ _

(14-15) ___ _

18D APECA - Agence de Promotion Economique du Canada Atlantique_____

_____(16-17) ___ _

(18-19) ___ _

18E Centre de technologie manufacturière in the province_____

_____(20-21) ___ _

(22-23) ___ _

18F Centre d'innovation N-B à Fredericton _____

_____(24-25) ___ _

(26-27) ___ _

18G Le Centre d'Incubation localisé à U.N.B._____

_____(28-29) ___

(30-31) ___ _

18H Conseil national de recherches (CNRC) _____ (32-33) __ __

18I L'Association des manufacturiers canadiens _____ (34-35) __ __

(36-37) __ __

18J CADMI à UNB _____ (38-39) __ __

(40-41) __ __

18K CADMI à U de M _____ (42-43) __ __

(44-45) __ __

18L Commissions pour le developement industriel _____ (46-47) __ __

(48-49) __ __

(50-51) __ __

Q.19 En pensent de ces ministères, organismes ou compagnies...y en a-t-il un ou une en particulier qui semble être plus en mesure de répondre aux genres de questions que vous pourriez avoir concernant la recherche scientifique ou les changements technologiques? SI OUI: DEMANDEZ LEQUEL OU LAQUELLE ET POURQUOI?

NOM DU FOURNISSEUR_____(52-53)___ ___

POURQUOI_____

_____(54-55)___ ___

Q.20 S'il y avait un numéro de téléphone ou un endroit que vous pourriez visiter...un genre de magasin à rayon contenant toutes les informations scientifiques et technologiques pour les compagnies...seriez-vous très intéressé, plus ou moins intéressé, ou pas très intéressé de profiter de leur service?

TRES INTERESSE.....(56).....1

PLUS OU MOINS INTERESSE.....2

PAS TRES INTERESSE.....3

PAS DU TOUT INTERESSE.....4

NSP.....7

REF/N.A.....8

Q.21 INSCRIVEZ LE NOMBRE DE CONTACTS AFIN DE REJOINDRE CETTE COMPAGNIE.....(57)... ___

Q.22 INSCRIVEZ LA DUREE DE L'ENTREVUE.....(58-59)..___ ___

Ce sont toutes les questions que nous avons pour vous aujourd'hui. Merci beaucoup de votre collaboration.